

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Social/Economic

Community Cohesion

The overall impact of the proposed project may be expected to have some positive and negative impacts. The construction of a four-lane limited- or controlled-access facility may make it more difficult for some neighbors to interact because they will have to walk or drive longer distances to see one another. Displacements may cause community members to move some distance from their present community. However, no communities will be divided to an extent that would prohibit access or make it extremely inconvenient for community members to continue present relationships. People generally identify with localities such as the city of Galena, the villages of Elizabeth, Stockton, and Lena, the township of Woodbine and the Galena Territory. The cores of these communities will remain intact; the Preferred Alternate will bypass these towns. While some members of project area communities may have to travel slightly longer distances to their destinations, the long-term impact of such inconveniences on community cohesion will be minor. People, families, farms, and businesses which are displaced may move to places more distant from their present communities, but closer to another community. Therefore, the social impacts of the relatively modest number of displacements associated with the Preferred Alternate will most likely in the long run prove to be minor.

Community cohesion in the project area may be strengthened in some ways by the proposed project. Travel times between communities will be reduced, facilitating more interaction among towns between Galena and Freeport. Improved accessibility among communities can lead to a beneficial interchange of ideas and views, and make it possible for people to extend networks of friends, and for more distant relatives to see one another more often.

Access Changes

The Preferred Alternate involves the least number of roadway closures (4) when compared to the other Alternates that were evaluated. These occur on local roads near Woodbine, Lena (2 roads), and at the eastern terminus of the project near Bolton Road. In each of these cases, the existence of nearby Freeway interchanges will offset the effects of the roadway closures. The locations of roadway closures that are expected with the Preferred Alternate are shown in Figures 4-1 and 4-2.

The Preferred Alternate will also require several roadway relocations. However, these will be very local in nature, and should not cause any considerable inconvenience.

Access changes for farms and residences are affected by roadway closures and relocations as well as closures or relocations of driveways. The access changes expected for farms and non-farm residences for the Preferred Alternate are presented in Table 4-1.

Public Services and Facilities

Figure 4-1 and Figure 4-2 also depict the public facilities within the project area in relationship to the Preferred Alternate.

School bus routes could be slightly affected by some of the local road closures as previously discussed. However, none of those road closures are expected to cause more than minor



Figure 4-1 Public Facilities and Roadway Closures, Alternate 2: Galena-Woodbine –
T:\IDOT\1283\Reports\EIS\Condensed Final EIS\Figurer 4-1.doc



Figure 4-2 Public Facilities and Roadway Closures, Alternate 2: Woodbine-Freeport -
T:\IDOT\1283\Reports\EIS\Condensed Final EIS\Figurer 4-2.doc



TABLE 4-1
ACCESS CHANGES FOR FARMS AND RESIDENCES
U.S. ROUTE 20, GALENA TO FREEPORT
SUMMARY COMPARISON OF ALTERNATES

Alternate Number	Route Description	ACCESS CHANGES FOR FARMS*		
		Moderate Access Inconvenience**	Severe Access Inconvenience**	Total Farms Affected
1	Longhollow Freeway	5	9	14
2	Longhollow Freeway w/Stockton Alt.	5	9	14
3, 7	Irish Hollow Freeway	6	13	19
4, 9	Irish Hollow Freeway w/Stockton Alt.	6	13	19
5, 8	Irish Hollow Freeway w/Tunnel	6	12	18
6, 10	Irish Hollow Freeway w/Tunnel w/Stockton Alt.	6	12	18
11	Expressway Eleroy Alt.	20	42	62
12	Expressway Lena Alt.	18	32	50

Alternate Number	Route Description	ACCESS CHANGES FOR NON-FARM RESIDENCES*		
		Moderate Access Inconvenience**	Severe Access Inconvenience**	Total Residences Affected
1	Longhollow Freeway	0	1	1
2	Longhollow Freeway w/Stockton Alt.	0	1	1
3, 7	Irish Hollow Freeway	0	2	2
4, 9	Irish Hollow Freeway w/Stockton Alt.	0	2	2
5, 8	Irish Hollow Freeway w/Tunnel	0	1	1
6, 10	Irish Hollow Freeway w/Tunnel w/Stockton Alt.	0	1	1
11	Expressway Eleroy Alt.	17	6	23
12	Expressway Lena Alt.	17	3	20

The Preferred Alternate is highlighted.

*Includes only farms and residences adjacent to existing or new U.S. Route 20.

**Definitions of Access Impact Types

Moderate Access Inconvenience

- Relocation of driveway entrance to public road system, or
- Increase of driving distance to U.S. Route 20 < ½ mile.

Severe Access Inconvenience

- New driveway in entirely different location;
- U-turn necessary for full access to U.S. Route 20;
- Residence area surrounded by roads; or,
- Increase of driving distance to U.S. Route 20 of > ½ mile.



inconvenience, which can be readily addressed by re-routing a few school bus routes, something which is normally done during each school year to adjust to changes in student residence locations. There will be some school district tax base reductions as a result of the acquisition of private properties. However, there will be no school property taken by the Preferred Alternate.

The anticipated road closures for the Preferred Alternate will be either located near proposed interchanges, or will be mitigated by the construction of local roads, resulting in no adverse effects on access to fire protection and emergency services. **It is not anticipated that any other Public Service or Facility will be affected.**

Residential and Farmstead Displacements

The Preferred Alternate includes the displacement of 34 residences and 3 businesses. Of the 34 residential displacements, 25 are farmsteads containing 103 buildings. Of the 103 buildings, 30 are major farm buildings and the remaining 73 are ancillary buildings.

In accordance with the Uniform Assistance and Real Property Acquisition Act of 1970 (as amended), a program of relocation assistance and payment is available through the Department. Policies implemented by the Department attempt to ensure that displaced persons receive fair and equitable treatment without discrimination and that the construction of any highway project designed for the benefit of the public will not result in undue hardship to any individual or group. Payments covering moving costs and supplemental housing and advisory assistance services are offered in addition to the state's payment for real property. If comparable quality housing is unavailable at the time of displacement, relocation payments based on last resort housing may be necessary.

Property acquisition will be staggered to correspond with each construction section of this project. For any given construction section, property acquisition will likely last at least one year but should not last longer than six years because of construction staging. Therefore, it should not be difficult for displaced residents to find comparable housing within the general area of their present residences.

Economic

Three (3) business displacements would be required for the Preferred Alternate.

The displaced businesses are all small retail establishments, none employing more than five people. Examples are an antiques mall and a flower shop-convenience store. None of the businesses that would be displaced are "one of a kind" whose loss would result in the absence of a particular service or type of goods in a community. No major industrial facilities will be displaced.

With regard to displaced businesses, there is ample land available in close proximity to any business that could be potentially displaced that is suitably zoned with adequate infrastructure.

In accordance with the Uniform Assistance and Real Property Acquisition Act of 1970 (as amended), a program of relocation assistance and payment will be available through the Department. Policies implemented by the Department attempt to ensure that displaced businesses receive fair and equitable treatment without discrimination and that the construction of any highway project designed for the benefit of the public will not result in undue hardship to



any individual or group. Payments covering moving costs and advisory assistance services are offered in addition to the state's payment for real property.

**TABLE 4-2
PROPERTY DISPLACEMENTS
U.S. ROUTE 20, GALENA TO FREEPORT
SUMMARY COMPARISON OF ALTERNATES**

Alternate Number	Route Description	RESIDENCES DISPLACED		
		<i>Residences</i>	<i>Farmstead Residences</i>	<i>Total Residences</i>
1	Longhollow Freeway	9	25	34
2	Longhollow Freeway w/Stockton Alt.	9	25	34
3, 7	Irish Hollow Freeway	11	23	34
4, 9	Irish Hollow Freeway w/Stockton Alt.	11	23	34
5, 8	Irish Hollow Freeway w/Tunnel	10	21	31
6, 10	Irish Hollow Freeway w/Tunnel w/Stockton Alt.	10	21	31
11	Expressway Eleroy Alt.	30	34	64
12	Expressway Lena Alt.	28	25	53

Alternate Number	Route Description	FARM BUILDINGS DISPLACED		
		<i>Major Farm Buildings*</i>	<i>Ancillary Structures**</i>	<i>Total Farmstead Buildings</i>
1	Longhollow Freeway	27	76	103
2	Longhollow Freeway w/Stockton Alt.	30	73	103
3, 7	Irish Hollow Freeway	9	37	46
4, 9	Irish Hollow Freeway w/Stockton Alt.	28	67	95
5, 8	Irish Hollow Freeway w/Tunnel	24	69	93
6, 10	Irish Hollow Freeway w/Tunnel w/Stockton Alt.	27	66	93
11	Expressway Eleroy Alt.	44	103	147
12	Expressway Lena Alt.	33	100	143

Alternate Number	Route Description	COMMERCIAL BUILDINGS DISPLACED
		<i>Number of Buildings</i>
1	Longhollow Freeway	3
2	Longhollow Freeway w/Stockton Alt.	3
3, 7	Irish Hollow Freeway	3
4, 9	Irish Hollow Freeway w/Stockton Alt.	3
5, 8	Irish Hollow Freeway w/Tunnel	3
6, 10	Irish Hollow Freeway w/Tunnel w/Stockton Alt.	3
11	Expressway Eleroy Alt.	6
12	Expressway Lena Alt.	5

The Preferred Alternate is highlighted.

* Major Farm Buildings include large barns, grain bins, and silos.

** Ancillary Structures include sheds and other outbuildings.



Employment, Output and Income Impact

The proposed project would stimulate the regional economy during the construction phase. Economic impacts would result from material purchases in the region, construction payrolls, and related indirect and induced spending, or "multiplier effects." In assessing the economic impacts of the project, it is important to recognize that economic benefits associated with the construction phase would occur for a relatively limited time during the actual construction.

Table 4-3 provides a summary of the estimated economic impact in terms of sales output, employment, and income generated by the Preferred Alternate and the Alternates that were evaluated in the DEIS, please see Section 4.1.6. Table 4-3 suggests that the total construction budget for the Preferred Alternate is \$577.40 million. Positively related to the total construction budgets, the project construction may generate \$282.60 million total sales, 6,857 total employment, and \$122.80 million total income.

Tax Revenue

Project-related construction would remove assessed land and buildings from the local tax base and would have a short term adverse effect on local property tax receipts. A tax revenue loss analysis was prepared for each taxing district in the two-county area. The effect on property tax revenue was calculated by determining the approximate value of land being taken and market value of structures removed from the taxing units for each alternate. Jo Daviess County would have a revenue loss of \$41,444 and a tax loss of 1.4 percent. Stephenson County would have a revenue loss of \$20,862 and a tax loss of 0.004 percent. Table 4-4 presents the tax revenue loss for all alternates that were evaluated in the DEIS, Section 4.1.7.

Land Use and Development Trends

Land uses converted to highway use include any land which will be acquired in order to construct the project. The character of the land use impacts of the project can be conveyed by considering land cover, which means the type of geographic feature found on the land. Land cover includes, for example, forests, cropland, wetlands of various types, water, or developed land. The distinction between land use and land cover is minor. Land use usually considers the use of parcels of land, while land cover occurs irrespective of ownership.

Table 4-5 presents the types of land cover which will be converted by the Preferred Alternate and the Alternates that were evaluated in the DEIS, please see Section 4.1.8.

The vast majority of land to be acquired would be agricultural, namely pasture, cropland, or "other" agricultural, which consists mostly of land used for fencing. The Preferred Alternate would use nearly 83 percent of this land for the proposed project. Nearly 10 percent of the land to be acquired for the project would be forested. On the other hand, developed land would account for a very minor portion of total land to be acquired for the project.

Land use plans have been recently updated in both Jo Daviess and Stephenson Counties. The updated Future Land Use Plan for Stephenson County identifies the proposed U.S. Route 20 Alternates on the future land use maps⁵. The Jo Daviess County Comprehensive Plan notes that the proposed project is being planned, and that the project is "of major interest"⁶. A Draft

⁵ Stephenson County, Illinois, Future Land Use Plan, July, 2000.

⁶ Jo Daviess County Comprehensive Plan Baseline Data, Draft, April, 1998, p. XI-1.



TABLE 4-3
SUMMARY OF CONSTRUCTION SALES,
EMPLOYMENT AND INCOME GENERATION
ASSOCIATED WITH THE
FREEWAY AND EXPRESSWAY ALTERNATES

Alternates	Total Construction Budget (Dollars in Millions)	Total Sales Impact (Dollars in Millions)	Total Employment Impact	Total Income Impact (Dollars in Millions)
1: Longhollow Freeway w/North Simmons Mound	\$579.8	\$283.8	6,886	\$123.3
2: Longhollow Freeway w/South Simmons Mound*	\$577.4	\$282.6	6,857	\$122.8
3: Irish Hollow Freeway w/North Simmons Mound	\$620.6	\$303.7	7,371	\$132.0
4: Irish Hollow Freeway w/South Simmons Mound	\$618.2	\$302.5	7,342	\$131.5
5: Irish Hollow Tunnel Freeway w/North Simmons Mound	\$632.7	\$309.6	7,514	\$134.5
6: Irish Hollow Tunnel Freeway w/South Simmons Mound	\$630.3	\$308.4	7,485	\$134.0
7: Upper Irish Hollow Freeway w/North Simmons Mound	\$611.0	\$299.0	7,256	\$129.9
8: Upper Irish Hollow Tunnel Freeway w/North Simmons Mound	\$623.0	\$304.9	7,399	\$132.5
9: Upper Irish Hollow Freeway w/South Simmons Mound	\$608.6	\$297.8	7,227	\$129.4
10: Upper Irish Hollow Tunnel Freeway w/South Simmons Mound	\$620.6	\$303.7	7,370	\$132.0
11: Expressway South Eleroy	\$451.5	\$221.0	5,362	\$96.0
12: Expressway North Eleroy	\$475.1	\$232.5	5,643	\$101.0

Sources: The Louis Berger Group, Inc., 2000.

Multipliers used was from *Benchmark Input-Output Accounts of the United States, 1992*, published September of 1998 by the US Department of Commerce, Bureau of Economic Analysis

* The Preferred Alternate is highlighted.



Statement of Goals and Objectives in the Jo Daviess Plan stresses the need for job creation and economic development, but does not specifically identify the proposed project. The emphasis in the goals statements was on scenic beauty protection, agricultural preservation, and preservation of rural character and quality of life.⁷

TABLE 4-4
TAX REVENUE LOSS IN 1997 DOLLARS BY ALTERNATE

Alternates	Sub-Total, Jo Daviess County	Sub-Total, Stephenson County	Total, Two- County Area	% Tax Loss	
				Jo Daviess County	Stephenson County
1: Longhollow Freeway w/North Simmons Mound	\$39,652	\$17,655	\$57,308	1.4	0.004
2: Longhollow Freeway w/South Simmons Mound*	\$41,444	\$20,862	\$62,306	1.5	0.005
3, 7: Irish Hollow/Upper Irish Hollow Freeway w/North Simmons Mound	\$50,723	\$18,898	\$69,621	1.8	0.004
4, 9: Irish Hollow/Upper Irish Hollow Freeway w/South Simmons Mound	\$47,432	\$18,904	\$66,336	1.7	0.004
5, 8: Irish Hollow/Upper Irish Hollow Tunnel Freeway w/North Simmons Mound	\$48,289	\$19,175	\$67,464	1.7	0.004
6, 10: Irish Hollow/Upper Irish Hollow Tunnel Freeway w/South Simmons Mound	\$45,429	\$19,179	\$64,608	1.6	0.004
11: Expressway South Eleroy	\$58,646	\$48,485	\$107,131	2.1	0.01
12: Expressway North Eleroy	\$58,537	\$45,766	\$104,303	2.1	0.01

Source: The Louis Berger Group, Inc., 2002.

Note: Tax loss information for each taxing district, by Alternate, is found in Appendix M of the DEIS.

* The Preferred Alternate is highlighted.

⁷ Jo Daviess County Comprehensive Plan, Draft Goals and Objectives, October 27, 1998.



TABLE 4-5
U.S. ROUTE 20 LAND COVER CONVERSION TO HIGHWAY USE

Acres of Land Cover by Alternate:								
	Pasture	Cropland	Other Agriculture	Forest	Open	Water	Developed Land	TOTAL*
Alternate 1	698.8	1,681.5	4.8	271.7	11.3	2.8	62.2	2,901.7
Alternate 2**	689.1	1,670.1	4.8	274.0	11.2	2.8	61.8	2,869.1
Alternate 3	627.6	1,949.9	4.8	257.5	14.2	3.5	64.3	3,101.6
Alternate 4	617.9	1,938.5	4.8	256.8	14.1	3.5	63.9	3,066.0
Alternate 5	642.6	1,900.4	4.8	241.0	14.2	7.1	67.9	3,051.5
Alternate 6	632.9	1,889.0	4.8	240.3	14.1	7.1	67.5	3,015.9
Alternate 7	621.6	1,795.0	4.8	304.6	19.7	3.0	78.8	3,011.6
Alternate 8	636.6	1,745.5	4.8	288.1	19.7	6.6	82.4	2,961.5
Alternate 9	611.9	1,783.6	4.8	303.9	19.6	3.0	78.4	2,976.0
Alternate 10	626.9	1,734.1	4.8	287.4	19.6	6.6	82.0	2,925.9
Alternate 11	592.4	1,526.6	0.7	304.3	36.6	3.1	166.9	2,960.9
Alternate 12	611.4	1,532.8	0.7	304.0	34.1	3.1	149.6	2,933.1

Percent of Land Cover by Alternate:								
	Pasture	Cropland	Other Agriculture	Forest	Open	Water	Developed Land	TOTAL*
Alternate 1	24.1%	57.9%	0.2%	9.4%	0.4%	0.1%	2.1%	100.0%
Alternate 2**	24.0%	58.3%	0.2%	9.5%	0.4%	0.1%	2.2%	100.0%
Alternate 3	20.2%	62.9%	0.2%	8.3%	0.5%	0.1%	2.1%	100.0%
Alternate 4	20.2%	63.2%	0.2%	8.4%	0.5%	0.1%	2.1%	100.0%
Alternate 5	21.1%	62.3%	0.2%	7.9%	0.5%	0.2%	2.2%	100.0%
Alternate 6	21.0%	62.6%	0.2%	8.0%	0.5%	0.2%	2.2%	100.0%
Alternate 7	20.6%	59.6%	0.2%	10.1%	0.7%	0.1%	2.6%	100.0%
Alternate 8	21.5%	58.9%	0.2%	9.7%	0.7%	0.2%	2.8%	100.0%
Alternate 9	20.6%	59.9%	0.2%	10.2%	0.7%	0.1%	2.6%	100.0%
Alternate 10	21.4%	59.3%	0.2%	9.8%	0.7%	0.2%	2.8%	100.0%
Alternate 11	20.0%	51.6%	0.0%	10.3%	1.2%	0.1%	5.6%	100.0%
Alternate 12	20.8%	52.3%	0.0%	10.4%	1.2%	0.1%	5.1%	100.0%

*Not including unmapped areas.

**The Preferred Alternate is highlighted.

Source: The Louis Berger Group, Inc., 2001.

However, the Overall Economic Development Plan for Jo Daviess County specifically mentions the need for the proposed project. This Plan, which was developed by a 30-member committee comprised of representatives from business and government, states as a county goal, "Support Highway 20 development".⁸

According to the updated Stephenson County Comprehensive Plan, "the construction of a new four lane divided U.S. Route 20 Freeway west of Freeport represents the highest priority transportation planning item for the region". The County's Future Land Use Plan has been designed to work with either the Freeway or Expressway Alternates, although the county has

⁸ 1997 Overall Economic Development Program, Jo Daviess Development, Inc.



identified its preference for the Freeway Alternate. According to the Plan, “the Freeway Alternate reinforces the Primary Future Land Use Plan Goals listed in Chapter 3” of the plan.

Environmental Justice

This project was evaluated in accordance with Executive Order 12898. Galena is 98 percent white, with a minority population of 0.8 percent. The median family income was \$44,063. Families below the Census Poverty Threshold are 4.3 percent. Elizabeth is 99 percent white, with a minority population of 0.3 percent. The median family income was \$41,354. Families below the Census Poverty Threshold are 4.5 percent. **Woodbine is 99.3 percent white, with a minority population of 0.5 percent. The median family income for Woodbine was \$31,403. Families below the Census Poverty Threshold are 6.3 percent.** Stockton is 99.7 percent white, with a minority population of 0.1 percent. The median family income was \$43,173. Families below the Census Poverty Threshold are 4.5 percent. Lena is 98.6 percent white, with a minority population of 0.3 percent. The median family income was \$49,375. Families below the Census Poverty Threshold are 2.2 percent. Freeport is 81.8 percent white, with a minority population of 15 percent. **The median family income was \$43,787. Families below the Census Poverty Threshold are 9.9 percent.**

The Census Poverty Threshold for a family of four in 2000 was \$17,029. **The 2004 Health and Human Services Poverty Guideline for a family of four is \$18,850.** Based on Census information, field observations, and public involvement activities, minority and low-income populations will not be disproportionately adversely affected by this project.

4.2 Agriculture

Analysis of the potential agricultural impacts involved the examination of federal, state, and local regulatory requirements and determination of monetary, land, drainage, and transportation effects. The analysis centered on acreage to be taken for the proposed right of way. Agricultural impacts for the Preferred Alternate are summarized in Table 4-6.

The Preferred Alternate will require 955 hectares (2,360 acres), or 0.3 percent of land in Jo Daviess and Stephenson Counties. Of those 955 hectares (2,360 acres), 343 hectares (842 acres), 0.1 percent, will be from prime farmland and an additional 442 hectares (1,087 acres), 0.1 percent, will be from important farmland. Soils suitable for farming, soil capability classes I and II) would lose 401 hectares (986 acres), 0.1 percent of the total land in both counties. Please note that prime and important farmland are separate criteria from soil capability class soil.

The Illinois Department of Agriculture (IDOA) uses the Land Evaluation and Site Assessment (LESA) System to assess general effects to agriculture caused by state and federal projects. LESA results are based on the total right of way acreage. The maximum score that can be received under the LESA evaluation is 300 points. The higher the point value assigned, the more viable the alternate is for agricultural uses and the greater the impact. The Preferred Alternate scored a total of 210 points, below the point (greater than 225) where alternates should receive the highest level of protection from conversion to non-agricultural uses. Selecting the alternate with the lowest total points will usually protect the best farmland located in the most agriculturally viable areas. The Preferred Alternate had the lowest point total and fell in the 176 to 225 group – alternates in the moderate range for protection. The AG-1006 forms may be found in Appendix A.



TABLE 4-6
AGRICULTURAL IMPACTS FOR THE PREFERRED ALTERNATE

Right of Way from Agricultural Resources	955 hectares (2,360 acres)
Prime and Important Farmland	785 hectares (1,929 acres)
Prime Farmland	343 hectares (842 acres)
Important Farmland	442 hectares (1,087 acres)
Soil Capability Classes (I & II)	401 hectares (986 acres)
Land Evaluation and Site Assessment (300 points max.)	210
Conservation Reserve Program (CRP)	
Area of CRP lands	58 hectares (143 acres)
Percentage of CPR lands	0.4
Centennial Farms	3
Severed Parcels	
Area	6,471 hectares (15,989 acres)
Number	98
Affected Parcels	67
Severance Management Zones	57 hectares (142 acres)
Landlocked Parcels	
Area	222 hectares (548 acres)
Number	34
Adverse Travel	177 kilometers (110 miles)
Displacements	
Farm Residences	25
Other Farm Structures	85
Agricultural Income Loss (based on 2000 data)	\$709,000

The number of farm buildings that require demolition or removal due to highway construction, including farm residences, barns, sheds, pens, bins, silos, windmills, or other structures associated with farm operations, was determined from field reconnaissance of the proposed alternates and review of recent aerial photographs. The Preferred Alternate will displace the fewest number of farm residences, 25, and the least amount of other farm structures at 85.

To estimate the loss of agricultural income from right-of-way takes, the total number of farm acres per county was divided into the total agricultural receipts (including livestock) from each county. The resulting number gives an approximate annual income loss for an acre of land in each county. The figures generated for Jo Daviess and Stephenson Counties were multiplied by the approximate agricultural acres taken by the right of way in each county to determine income loss resulting from construction of the Preferred Alternate. The Preferred Alternate has an agricultural income loss of \$709,000 per year (based on 2000 prices).

4.3 Cultural Resources

The cultural resources surveys conducted along the project corridor recorded numerous prehistoric and historic sites. Of over 300 historic period standing structures recorded, only five which are potentially eligible for listing on the National Register of Historic Places may be adversely impacted by the proposed project construction. However, none of these structures—three houses and two barns—will be directly impacted. **On September 24, 2001, the Illinois SHPO concurred with the findings that the proposed project will have no impact on any of the five structures as stated in IDOT's September 20, 2001, letter.**



All mounds and cemeteries will be avoided by the proposed project. To date, no archaeological sites historically associated with a federally-recognized Native American tribe have been found in the project area. A total archaeological survey will be conducted just prior to Phase II (design plan preparation) work. At that time, the results of this survey will be submitted to the Illinois SHPO and to the Native American tribes enumerated in Section 2.5 of the DEIS for review and comment. Should archaeological sites be found in the Preferred Alternate's alignment, which has the potential to meet the criteria for eligibility for the National Register, a program of subsurface evaluation will be implemented. The results of these investigations will then be evaluated for a Determination of Eligibility (DOE) for the National Register of Historic Places. A formal DOE will be submitted to the Illinois SHPO for concurrence. Should any of these archaeological sites be determined eligible, a data recovery plan will be formulated and submitted to the Illinois SHPO and the Federal Highway Administration under the Statewide Programmatic Agreement for Prehistoric Sites, ratified on September 19, 2002. A copy of the data recovery plan will then be filed with the Advisory Council on Historic Preservation.

All of the prehistoric archaeological sites found to date which are within the project corridor are the remains of former habitation sites. All of the historic period archaeological sites within the alternate alignments are the remains of former habitation sites or industrial sites (mines or pottery works). The potential significance of these archaeological sites rests upon the scientific data, which they may contain. None of these sites requires preservation in place, none are cemeteries, and none are subject to Section 4(f) of the Transportation Act of 1966.

4.4 Air Quality

Project Impacts

The results of the CO modeling for the village of Lena indicate that the CO concentrations are predicted to decrease from the No-Action Alternative. The proposed project is predicted to have a slightly beneficial effect on air quality, and is below the eight-hour NAAQS for CO of 9.0 ppm. Outside of Lena, the proposed project will result in CO concentrations well below the NAAQS for CO of 9.0 ppm.

Demolition and construction activities can result in short-term increases in fugitive dust and equipment-related particulate emissions in and around the project area. (Equipment-related particulate emissions can be minimized if the equipment is well maintained.) The potential air quality impacts will be short-term, occurring only while demolition and construction work is in progress and local conditions are appropriate.

The potential for fugitive dust emissions typically is associated with building demolition, ground clearing, site preparation, grading, stockpiling of materials, on-site movement of equipment, and transportation of materials. The potential is greatest during dry periods, periods of intense construction activity, and during high wind conditions.

The Department's Standard Specifications for Road and Bridge Construction include provisions on dust control. Under these provisions, dust and airborne dirt generated by construction activities will be controlled through dust control procedures or a specific dust control plan, when warranted. The contractor and the Department will meet to review the nature and extent of dust-generating activities and will cooperatively develop specific types of control techniques appropriate to the specific situation. Techniques that may warrant consideration include measures such as minimizing track-out of soil onto nearby publicly traveled roads, reducing speed on unpaved roads, covering haul vehicles, and applying chemical dust suppressants or water to exposed surfaces,



particularly those on which construction vehicles travel. With the application of appropriate measures to limit dust emissions during construction, this project will not cause any significant, short-term particulate matter air quality impacts.

Further detailed information regarding project related impacts and conformity is provided in Section 4.4 of the DEIS and in Volume I of the Air Quality Technical Report which was prepared separate to the DEIS.

4.5 Noise

Impacts

Impacts were analyzed and evaluated against the Noise Abatement Criteria (NAC) described in Section 2.0 of the DEIS and in Volume I of the Noise Technical Report. The FHWA criterion for category B land use receptors dictates that a noise impact exists when noise levels approach (within one dBA) or exceed 67 dBA. In addition, the Department's policy considers an impact to occur when noise levels increase by more than 14 dBA over existing noise levels due to a project's traffic noise. Mitigation measures were considered and evaluated, per FHWA and Department policies, when an impact was determined to have occurred. As part of the mitigation analysis, noise barriers were analyzed for receptors along the alignment of the Preferred Alternate. The following table summarizes the impacts as a result of the Preferred Alternate.

**TABLE 4-7
NOISE IMPACT SUMMARY TABLE – PREFERRED ALTERNATE**

Section	No. of Receptors	Existing Year L _{eq} (dBA)		Year 2020 L _{eq} (dBA)		Receptor Meets or Within 1 dBA of NAC	Receptor Greater than 14 dBA above Existing
		min.	max.	min.	max.		
AB	22	49	64	57	68	3	2
BF	11	48	56	58	70	2	1
FG	0	NA	NA	NA	NA	NA	NA
GH(N)	7	49	60	57	68	1	0
HJ	20	44	57	58	69	7	7
JK	7	49	66	62	75	5	1
TOTAL	67	44	66	57	75	13	8

NA = Not applicable

Mitigation

The most common type of designed mitigation is the construction of physical barriers, typically in the form of noise walls (noise barriers) and/or earth berms between the roadway (noise source) and the receiver locations. According to the Department's *Procedures for Highway Project Noise Analyses*, a minimum of 8-dBA reduction in highway traffic noise levels is required to protect the receptor(s). Mitigation is designed to achieve these levels of noise reduction rather than a specified absolute noise level. Therefore, mitigation may be appropriate even if the mitigated noise level exceeds FHWA's NAC for a particular activity category.

The majority of the identified impacted noise receptors are scattered too far apart to permit noise barriers to be built at a reasonable cost. Therefore, noise barriers were not studied for areas, communities, and subdivisions with less than six sensitive receptors. No sensitive receptors along the Preferred Alternate were identified as being impacted. Therefore, noise barriers were not evaluated for noise mitigation.



Other types of noise barriers, i.e., earth berms or vegetation screenings, are limited in effectiveness unless large parcels of land immediately adjacent to the source are acquired and/or impacted for this use. Landscaping does provide a line-of-sight abatement that can reduce the psychological effects of traffic noise (i.e., if a receptor cannot see the source of noise, there is a perceived lessening of the noise generated). But, as stated earlier, the majority of the identified impacted noise receptors along the Preferred Alternate are scattered too far apart to permit noise barriers, of any kind, to be built at a reasonable cost. This addresses comment 1 in Section 5.4 in this FEIS.

Construction Noise

Construction noise differs from traffic noise in the length, type and duration of noise events. Construction noise is of a fixed duration and ceases at the completion of the construction phase. Construction noise, usually limited to daylight hours, differs from normal vehicular traffic noise, which continues throughout the day- and nighttime hours. Additionally, construction-related noise is responsible for a variety of impulsive, discontinuous noise sources, such as jack-hammers and/or vibratory rollers. Traffic noise, although varying in level, is more continuous as a noise source. A temporary increase in noise levels will occur during the time period that construction takes place. Noise levels due to construction, although temporary, can impact areas adjacent to the proposed project.

Construction noise will be controlled in accordance with Article 107.35 of the *Standard Specifications for Road and Bridge Construction* as adopted January 1, 2002. In addition, the following mitigation strategies will be employed to the greatest extent possible to limit the potential impact of noise during construction.

4.6 Natural Resources

4.6.1 Geology

The proposed project has the potential to impact geological resources. In addition, surface conditions (soils and geology) and bedrock geology along the proposed alignments place constraints on construction practices and project design.

Surface Geology and Topography

Highly erodible soils occupy approximately 9,238 hectares (22,826 acres) of the project area. Areas of highly erodible lands are mainly confined to steeply sloping upland areas. The location of the roadway will be placed to minimize soil cuts and long-term maintenance issues including sloughing. Erosion control features will be designed to minimize soil erosion during the Phase II design process in accordance with the *Standard Specifications for Road and Bridge Construction* (IDOT 2002).

Karst

In the Driftless Section, the proposed roadway will be susceptible to impacts from karst features present in underlying carbonate rocks. These impacts include instability from the increased loading on existing rock cavities or the removal of structurally sound overburden and rock cover over existing cavities (Fischer *et al.* 1993). Construction related changes in the water table can induce subsidence and undermine the highway (Mellett and Maccarillo 1993). In karst terrains, groundwater is very susceptible to contamination from stormwater runoff because of rapid recharge through open conduits. The infiltration of stormwater runoff can facilitate the



development of collapse features. If Karst features are encountered during the design of the Preferred Alternate, special design consideration will be applied to prevent groundwater contamination. Stormwater runoff drainage designs will minimize infiltration and convey runoff to discharge points outside the vulnerable area, as necessary.

Of the twelve alternates, the Preferred approaches the fewest known karst features (see Table 4-8). No known karst features will be impacted by the project. However, it is recognized that some karst features are not readily observable (such as solution-enlarged cavities). During construction, some of these features may be uncovered. At that time, the Department will analyze the situation and obtain a solution that will avoid these features becoming direct conduits for highway runoff to enter the groundwater.

Land Subsidence and Landslides

In the areas surrounding Galena and Elizabeth, the alternates traverse areas with abandoned mines. Areas close to underground mines may be susceptible to subsidence (Bauer *et al.* 1993). Of the nine mines that are within 152 meters (500 feet) of the proposed right of way (as described in Section 4.6.1.5 of the DEIS), none will be impacted by the Preferred Alternate.

Various surficial geological conditions, prone to slumping (**land subsidence**) and landsliding, exist equally throughout the project area. Stability will be considered in road design. Units of particular concern are Silurian dolomites, weathered Maquoketa shale, and soils with low cohesive strength. The geotechnical engineering reports prepared for the proposed project have identified potential impacts and constraints imposed by the geotechnical properties of the surface and subsurface material anticipated to be encountered during construction. **Measures to address potential problems associated with surficial geological features will be incorporated into the Phase II design process.** These measures for rock slopes are reinforcing the unstable cut slopes with retaining walls; cement grouting of fissured, cracked and creviced rocks; placing wire mesh on excavated and natural rock slopes to prevent the falling of rocks; and placing gabion baskets combined with wire mesh to protect slope faces. When subsurface embankment is saturated, embankment failure is possible. Water can be prevented from saturating pavement subgrades by installing drains to divert surface runoff or by removing water in subgrades with underdrains or drainage blankets.

Further detailed information on land subsidence and landslides is provided in Section 4.6.1.5 of the DEIS.

Groundwater Resources

The sensitivity of aquifers to contamination in the corridor is shown in Figure 2-3. Stephenson County has not been mapped and is not included in this analysis. The sensitivity of aquifers along each alternate has been summed by roadway mileage and is presented in Table 4-8. In general, high aquifer sensitivity in Jo Daviess County occurs due to highly permeable bedrock or sand and gravel aquifers near the lands surface. Low aquifer sensitivity is found in areas underlain by shale, or where bedrock is covered by glacial sediments in the eastern part of the county. Alignments 1 and 2 (preferred alternate) crossed the highest amount of land classified as having high aquifer sensitivity, and alignments 5 and 6 crossed the least amount of land classified as having high aquifer sensitivity (Weaver, Carstens, and Miner 2004).

Potential impacts to groundwater resources from the proposed project include encroachment into Wellhead Protection Areas and setback zones; loss of aquifer recharge area; and impacts



to groundwater quality by contaminants associated with project related construction period and post-construction activities.

An inventory of wells located near each alternate was conducted in 2001 (ISGS2001). Although 26 of the 171 wells identified by ISGS are within 61 meters (200 feet) of the centerline of the alternates, the 61-meter (200-foot) wellhead setback is only relevant for routes or sources of groundwater pollution. Since the project will not introduce any new routes (dry wells or borrow pits) or sources (bulk road oil or deicing salt storage facilities), there will be no violation of the wellhead setback requirements.

Aquifers in the project area recharge by the infiltration of precipitation. The probability of precipitation infiltrating the soil surface and percolating downward to the uppermost aquifer has been mapped by Keefer and Berg (1990) as the potential for aquifer recharge. Due to the presence of a relatively impermeable weathered zone, stream alluvial deposits would be the areas most vulnerable to impacts from the loss of recharge area. There exists the potential need for borrow pits as part of the construction of the project. All borrow pits will require a permit issued during Phase III of the project.

Portions of these areas will be crossed on structure. There will be no loss to aquifer recharge area where the new road is on structure. Where the roadway is not on structure, the runoff from the new paved roadway surface will not be lost to the groundwater system but will be contained within it by being directed to grassed medians and roadside drainage ditches or local streams. Drainage ditches and embankment slopes after construction will be vegetated and non-paved, and thus will continue to facilitate recharge.

The replacement of pervious ground surfaces with impervious roadway surfaces will result in the loss of aquifer recharge area. However, the impacts to the aquifer system of the project area will be small.

Groundwater Quality

During construction, project related sources of contamination (e.g., disturbed contaminated sediments and groundwater) might exist. Accidental spills and temporary staging areas for construction equipment and supplies are also potential contaminant sources. When the roadway is operational, potential post-construction sources of contaminants are highway stormwater runoff, snowmelt from roadside snowbanks, and accidental spills. Unconfined sand and gravel aquifers and shallow, highly fractured bedrock aquifers are most vulnerable to water quality impacts, particularly in karst areas.

Conditions most favorable for rapid downward movement to shallow aquifers are not present in the project area. Thus, adverse impacts to groundwater quality from this project are not anticipated. However, best management practices will be implemented during the construction and post-construction phases of this project to minimize any infiltration of surface contaminants to ensure the greatest level of protection to groundwater quality.

If future investigations reveal that construction activities along the Preferred Alternate will encounter contaminated soils and groundwater **and impact karst aquifers**, the applicable waste disposal, dewatering, and effluent discharge rules and regulations will be followed and the proper permits will be obtained. Accidental spills will be cleaned up according to the regulatory requirements and measures will be implemented to limit infiltration. All disturbed contaminated soil or groundwater that is contaminated above the regulatory limits will be managed and disposed of according to all state and federal laws and regulations.



TABLE 4-8
SENSITIVITY OF AQUIFERS TO CONTAMINATION

Alternates	Alignment Mileage reported by the Department	Carbonate Bedrock (mileage along alignment)	Non-Carbonate Bedrock (mileage along alignment)	High Aquifer Sensitivity (mileage along alignment)	Moderate Aquifer Sensitivity (mileage along alignment)	Low Aquifer Sensitivity (mileage along alignment)	# of Known Karst Features within 500 feet of center line	# of Known Karst Features within 1000 feet of center line
1	47.9	32.3	13.6	19.7	1.9	11.7	4	8
2	47.8	32.2	13.7	19.7	1.8	12.0	4	8
3	50.3	30.9	20.0	18.5	1.9	17.5	5	10
4	50.2	30.8	20.1	18.6	1.8	17.8	5	10
5	49.8	30.9	19.4	15.8	1.9	17.1	6	12
6	49.7	30.8	19.5	15.9	1.8	17.4	6	12
7	48.9	32.8	16.3	19.0	1.9	15.7	6	11
8	48.4	32.8	15.7	19.0	1.9	15.4	7	13
9	48.8	32.7	16.4	19.1	2.7	16.0	6	11
10	48.3	32.7	15.8	19.0	2.7	15.7	7	13
11	43.4	22.5	21.9	16.4	1.1	17.4	6	14
12	42.9	23.9	17.3	16.4	1.1	17.4	6	13
Current U.S. Route 20	not provided	26.9	20.2	14.6	1.7	18.4	1	6

Alternates and other data listed by segment in the appendices. The Preferred Alternate is highlighted.
Note: Total miles may not have equal totals due to different methods and data sources used.

4.6.2 Biological Resources

Cover Types

Of the twelve alternates considered, the Preferred Alternate (Alternate 2) will require the least amount of land (Table 4-9). These cover types represent disturbed areas that typically have a low diversity of native plant species. The major cover types important to wildlife that would be affected by the Preferred Alternate include upland forest and wetlands. There are patches of native grassland but these areas are too small to have much wildlife value.

Upland Forest

Upland forest impacts vary from hectares (240.3 acres) in Alternate 6 to hectares (304.6 acres) in Alternate 7 (Table 4-9). The Preferred Alternate will impact approximately 109.7 hectares (274.0 acres) of upland forest. Approximately ninety percent of the impact to upland forest occurs between Galena and Woodbine. The forested areas are generally dominated by oaks, hickories and maples, depending on slope and past history. These areas also vary in age, presence/absence of shrub/sapling layers, and type and intensity of disturbance.



One area contains a forested area that is approximately 158 hectares (390 acres) in size. The forest is characterized as a mesic oak-maple hardwood. The Preferred Alternate will impact approximately 19 hectares (47 acres) of this forested area. Alternates 3 through 6 and Alternates 7 through 12 will impact approximately 19.4 hectares (48 acres) and 23.6 hectares (58.3 acres) of this area, respectively.

The loss of 274 acres of upland forest will be mitigated. The mitigation will be in the form of a forest restoration. That is, specific canopy, shrub, and herbaceous layers will be established. The goal of the restoration is to duplicate, as much as possible, the existing native upland forest plant community in the area adjacent to the project. Six parcels of land that lie between the proposed project and the Tapley Woods Land and Water Reserve will be utilized for upland forest restoration. These six parcels are currently in upland forest or pastureland. The parcels contain 209.5 acres of land, of which 105 acres are not forested. The addition and successful forest restoration at these locations will add an additional 209.5 acres of forest under public ownership and will help mitigate for the loss of Neotropical migrant bird species. The forested areas in the project area range

**TABLE 4-9
SUMMARY OF COVER TYPES AFFECTED BY EACH ALTERNATE**

Cover Type	in Acres											
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9	Alt. 10	Alt. 11	Alt. 12
Agricultural Land	1,504.8	1,493.4	1,765.2	1,753.8	1,758.2	1,746.8	1,563.5	1,556.5	1,552.1	1,545.1	1,367.7	1,357.1
Pasture	698.8	689.1	627.6	617.9	642.6	632.9	621.6	636.6	611.9	626.9	592.4	611.4
Upland Forest	271.7	274.0	257.5	256.8	241.0	240.3	304.6	288.1	303.9	287.4	304.3	304.0
Hayfield	176.7	176.7	184.7	184.7	142.2	142.2	231.5	189.0	231.5	189.0	158.9	175.7
Developed Land	62.2	61.8	64.3	63.9	67.9	67.5	78.8	82.4	78.4	82.0	166.9	149.6
Unmapped	29.8	39.8	22.1	22.1	24.8	24.8	22.1	24.8	22.1	24.8	28.3	20.1
Fence Row	140.3	127.0	159.2	145.9	150.2	136.9	163.5	154.5	150.2	141.2	291.2	266.5
Shrubland	5.5	5.5	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.7	6.5	9.0
Wetland	3.7	3.7	8.6	8.5	8.7	8.6	8.9	9.0	8.8	8.9	15.6	15.8
Floodplain Forest	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	10.8	10.8
Non-native Grassland	3.2	3.2	4.0	4.0	4.0	4.0	9.4	9.4	9.4	9.4	24.3	19.2
Forbland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Native Grassland	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	2.3	2.3
Tree Plantation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6
Total Acres	2,897.1	2,878.3	3,096.3	3,060.8	3,042.6	3,007.1	3,006.8	2,953.1	2,971.3	2,917.6	2,954.2	2,926.3
Total Hectares	1,174.2	1,164.8	1,255.2	1,240.8	1,234.9	1,220.5	1,218.8	1,198.5	1,204.3	1,184.1	1,198.2	1,187.0

Note: Total cover type impacts are presented in both metric and English units. The Preferred Alternate is highlighted.

Source: The Louis Berger Group, Inc., 2002.

from 40 to 100 years in age. Once the restoration is started it will take up to 40 to 60 years to achieve a submature forest on these types of slopes.

Other parcels that are being considered are isolated from other areas of forest. These areas will not attract Neotropical migrants but will provide oases in an otherwise agricultural landscape. The goal of the mitigation is the long-term restoration of upland forest dominated by species of oak and hickory.



Native Grassland

The proposed project will impact one dolomite hill prairie. This impact is common to all alternates (Table 4-9). The site is approximately 5.4 hectares (13.4 acres) in size and is dominated by little bluestem and eastern red cedar. Approximately 0.4 hectares (1.0 acre) of dolomite hill prairie will be located within the highway right-of-way but outside the proposed pavement area. **Of these 0.4 hectares (1.0 acre), 0.3 hectares (0.8 acres) have native grass.** Work at this location will involve a 10-foot vertical cut through the top of the bluff. The site could be impacted by blasting and related earthwork.

The Department will pursue acquisition of a conservation easement for a portion of two farm tract parcels (T-2453 and T-2454) located immediately adjacent to the dolomite hill prairie that will be on the states right-of-way. The easement will be sought in order to protect approximately 10.1 hectares (25 acres) of the remaining dolomite prairie. Although the Department will seek the easement, cooperation from the landowner(s) will be required, as well as a commitment from a conservation organization to manage the site once it has been designated for protection (see Section 4.15).

The Department will also purchase the 4.21 hectares (10.4 acres) landlocked parcel (T-1356) located north of Buckhill Road (between right Station 649+00 and 666+00) for the establishment of a mesic prairie. A prairie mitigation plan will be prepared and coordinated with IDNR for this site. This action will mitigate the 0.4 hectares (1.0 acres) of native grassland that will be impacted by the Preferred Alternate.

However, the dolomite hill prairie is not within the footprint of any proposed cut or fill activity and, therefore, the potential to minimize direct impacts exist. It is likely that this impact may be further minimized during the detailed design phase by placing a high priority on further reducing any impacts. During construction the impacts may be minimized by restricting construction activities to avoid the dolomite hill prairie as much as the design plans allow. The Department will work with the IDNR to provide long-term protection to this site. This addresses comment 8 in Section 5.4 in this FEIS.

Wildlife Resource Impacts

Wildlife impacts were assessed from the standpoint of construction impacts and subsequent use of the proposed highway. Construction of the Preferred Alternate will result in impacts to wildlife through the loss and alteration of existing vegetation and habitat. Construction impacts to wildlife have been assessed in terms of the acreage of habitat directly impacted. This includes the fragmentation and isolation of existing habitat, the disruption of wildlife movement, and the mortality of individual wildlife species during construction and subsequent roadway use (vehicle-wildlife crashes). These impacts will mostly occur to wildlife species that are common within the project area.

Habitat Loss

Loss of wildlife habitat can be measured through estimates of cover type losses that support wildlife. Construction of the Preferred Alternate will result in the loss or conversion of several cover types within the right of way that support various wildlife species (Table 4-9). Upland and floodplain forests, wetlands, and prairies are the more valuable and least impacted habitats within the project area. The Preferred Alternate will impact a large percentage (>80 percent) of agricultural land, hayfield, and pasture which generally have a lower value as wildlife habitat.



Habitat Fragmentation

Fragmentation of habitats is often a concern for roadways constructed on new alignments. The largest, contiguous forested areas are present in the Tapley Woods Land and Water Reserve. The Preferred Alternate will fragment an approximately 158 hectares (390 acres) upland forest located just west of the Tapley Woods Land and Water Reserve. Approximately 10.5 hectares (26 acres) of interior forested area will be lost and approximately 1,920 linear meters (6,300 linear feet) of edge would be created. These impacts will result in the loss of Neotropical migrant and bird-breeding habitat. The resulting edge effects will allow predation and nest parasitism to penetrate approximately 91 meters (300 feet) further into the forests. Area sensitive breeding birds such as vireos, ovenbirds, thrushes and warblers would be affected.

The direct and indirect loss of potential breeding habitat for neotropical migrant bird species will be mitigated in several ways. First, the inadvertent loss of nesting birds in the construction area will be avoided by the imposition of a tree clearing restriction. Tree removal will not be allowed between April 15 and September 5 of any given year (Table 4-10 Neotropical migrant breeding dates). This restriction only applies to the area west of Smallpox Creek to west of Furnace Creek containing habitat for Neotropical migrant species. Secondly, the loss of habitat will be mitigated by the purchase of approximately 200 acres of land adjacent to the Tapley Woods Land and Water Reserve (see Section 4.15). The acquisition of this land could reduce the edge effect and improve nesting success in the Land and Water Reserve. Of these 200 acres, 97 of these acres are not forested. These acres will be restored to upland forest. Thirdly, the Department will consult with the IDNR concerning the future of existing U.S. 20, which currently divides the Tapley Woods Land and Water Reserve. The drop in traffic volumes on this route may provide additional management options for Neotropical migrants in this area.

TABLE 4-10
NESTING SEASON DATES* FOR NEOTROPICAL MIGRANTS KNOWN
TO OCCUR IN THE PROJECT AREA, JO DAVIESS COUNTY, ILLINOIS

Species	Habitat	Nesting Season Dates	
		From	To
cerulean warbler	upland/bottomland forests	15 April	1 August
hooded warbler	bottomland forests	1 May	15 July
ovenbird	upland forests	1 May	15 July
wood thrush	wooded bottomlands	5 May	1 August
chestnut-sided warbler	brushy second growth forests	5 May	1 July
American redstart	bottomland forests	5 May	1 August
yellow-throated vireo	Forests	5 May	1 August
red-eyed vireo	upland/bottomland forests	10 May	15 July
Kentucky warbler	upland/bottomland forests	10 May	1 August
blackpoll warbler	Forests	10 May	15 August
scarlet tanager	upland/bottomland forests	10 May	1 August
yellow-billed cuckoo	woodlands, orchards	15 May	5 September

*Data compiled from H. David Bohlen, The Birds of Illinois (1989)

Barriers to Movement

A wildlife movement (or dispersal) corridor has been defined as a linear habitat the primary function of which is to connect two or more important areas of habitat (Harris and Gallagher 1989). Linear habitats, such as fence rows, rights-of-ways, and stream corridors provide habitat



for resident animals. Resident individuals may use a corridor, but it must be used by animals for travel (through their home ranges), dispersal, or migration. No such corridors were identified within the project area for white-tailed deer. It is expected that most movement of wildlife in the project area is by using stream corridors and drainage ways. The construction of a highway through a corridor could restrict the movements of some animals and might lead to an increase of road kill as individuals attempt to move along the corridor.

The Department initially attempted to identify important wildlife corridors within the project corridor. Due to the absence of multiple important or protected habitats linked by a corridor, no specific important wildlife corridors could be identified. The Department also examined records of reported whitetail deer-vehicle collisions along the length of U.S. Route 20 in Jo Daviess and Stephenson Counties. The deer-vehicle collision data does not indicate concentrated locations of deer-vehicle collisions that would suggest a particular area is serving as a wildlife corridor.

Wildlife movement within the project area probably occurs over shorter distances along abandoned railroad grades and riparian areas along stream corridors. Within the Tapley Woods area, the construction of any one of the proposed alternates will affect the movement patterns of larger mammals such as whitetail deer, red and grey fox, bobcat and coyote. The construction of a highway through a wildlife corridor will lead to an increase in wildlife collisions with vehicles.

Bridged stream and river crossings will maintain several potential wildlife movement corridors within the project area. **The movement of wildlife throughout the Preferred Alternate alignment has been identified and accommodated by proposed longer span bridges that do not impact riparian areas adjacent to rivers and streams, oversizing proposed drainage culverts under the proposed roadway to accommodate wildlife crossings and the proposed installation of crossings not required for drainage purposes to accommodate wildlife.**

Operational Mortality

Impacts to wildlife populations due to vehicle collisions are a potential consequence of the project. The majority of wildlife/vehicle collisions would involve common wildlife species. **Over the last 10 years, approximately 20 percent of the accidents along existing U.S. Route 20 were collisions with animals, predominantly deer.**

Generally, vehicle/animal collisions occur because roadways traverse areas of habitat used by animals. These collisions are magnified when sight distances along roadways are impaired by vertical and horizontal curves, poor lighting at dusk, and during inclement weather conditions. The Preferred Alternate (Alternate 2) and other alternates would have similar effects with regards to vehicle/animal mortality. All of these alternates would be expected to reduce vehicle/animal collisions because they will have much improved sight distances and traverse less habitat types preferred by wildlife. An area of high habitat value occurs adjacent to the Tapley Woods Land and Water Reserve between Smallpox and Furnace Creek. In this area, the installation of a number of wildlife underpasses is being proposed (see Section 4.15).

Construction Impacts

Construction activities that will affect wildlife within the project corridor include the clearing of vegetation, vehicle movement, and construction activities and blasting associated with rock cuts.



Mortality of small rodents and herpetofauna are expected to occur during the construction of the roadway, however, the populations of these animals are expected to recover quickly based on their natural fecundity and the abundance of habitat for these species. Avifauna and larger wildlife species will also experience a loss of habitat and likewise a loss of individuals through a reduction in the carrying capacity of available habitats. This effect would be more pronounced within the avifauna community. **A tree clearing restriction in the Tapley Woods Land and Water Reserve will minimize this effect.** Considering the small amount of habitat affected the loss of individual wildlife and habitat should not have a meaningful affect on existing wildlife populations.

- **Threatened and Endangered Species**

A letter dated July 18, 2003, from IDNR indicated that the project as described in the DEIS will not have any adverse impacts on Illinois endangered and threatened species. The commitments made in the DEIS concerning the timber rattlesnake will be incorporated into the projects design and construction phases (see Commitment Section).

Since the circulation of the DEIS two additional species have been added to the state list, Franklin's ground squirrel and the cerulean warbler. The habitat for Franklin's ground squirrel consists of tall, dense cover of grasses, forbs, shrubs and small trees; they avoid the short grass of grazed pastures or mowed areas. In the project area suitable habitat could be the prairie areas along the railroad right-of-way and the dolomite hill prairies. The project will impact approximately 0.8 acres of hill prairie. The hill prairie does not contain the dense cover required by the squirrel. Franklin's ground squirrel has not been reported from Jo Daviess County since 1943. Based on this information, we conclude that the project will not impact the Franklin's ground squirrel.

The cerulean warbler is known from Tapley Woods. This species could occur in the adjacent forested areas that will be impacted by the proposed project. To avoid killing the species during construction, a tree clearing restriction will be put into place. Tree removal between April 15 and September 5 of any given year between Smallpox Creek and Furnace Creek will be prohibited. This will avoid the nesting season of the cerulean warbler. Robinson (1994) indicated that the acquisition of land around Tapley Woods could reduce the edge effect and improve nesting success within the Land and Water Reserve for cerulean warblers. With the tree clearing restriction in place and the purchases of approximately 200 acres of land adjacent to the Land and Water Reserve, we have determined that the project will not affect the cerulean warbler.

- **Invasive Species**

The construction of the proposed project will create conditions that may allow for the establishment of populations of invasive/nuisance species of plants that already occur within the project area. Invasive or nuisance species can establish on the right of way during initial highway construction or afterwards due to maintenance practices. **The Department has adopted practices to minimize the introduction and spread of invasive plant species.** The Department controls invasive plant species by the application of herbicides as discussed in the DEIS. The Department uses a conservation seed mix composed of smooth brome grass and vernal alfalfa on highway foreslopes. The use of this mix makes it easier to maintain and is more cost effective. All backslopes are planted with a native prairie grass seed mix. Native plant materials will be used in specific locations, such as upland forest and prairie restoration sites, landscape plantings, and in other areas as identified through the continuous review of this project.



4.7 Surface Water Resources and Water Quality

Construction Impacts

The Preferred Alternate will involve the construction of **87 permanent structures (18 bridge and 69 culverts)** over the waterways within the project area. **The following streams will be bridged: Hughlett Branch Creek, Galena River, Tributary Galena River, Tributary Smallpox Creek, Smallpox Creek, Tributary Longhollow Creek, Furnace Creek (mainline US 20 and IL 84 Extension), Apple River, two Tributary's Apple River, three Tributaries Welsh Hollow Creek, Rush Creek, Tributary Yellow Creek, and Yellow Creek (mainline US 20 and Stees Road).** It is anticipated that a maximum 12.2-meter (40-foot) causeway will be installed adjacent to each proposed bridge location to allow for construction vehicle access. In-stream construction work will include temporary access and dewatering structures. Appropriate measures will be taken to maintain near normal downstream flows and to minimize flooding. Fill will be clean aggregate, and placed in a manner that will not be eroded by expected high flows and will not cause more than minimal adverse effects on aquatic resources. **A total of 61 culverts (box and/or pipe) will be installed in the smaller tributaries within the project area. The sizes of the culverts have yet to be determined, but will be based on the size of the watershed size above the stream crossing. Culvert lengths range from approximately 76.2 meters (250 feet) to 396.2 meters (1300 feet) in length. During the placement of some of these culverts, the stream channel will be channelized.** Where possible, culverts will be utilized to minimize the fill material placed and maintain flows. Temporary fill and channel changes will be entirely removed and dredged material returned to its original location, following completion of the construction activity. The affected areas will be restored to the pre-project conditions.

In order to minimize impacts during construction, temporary and permanent erosion and sediment control measures will be implemented at sites that expose areas of soil to erosion. The Department has established guidance and procedures to ensure compliance with FHWA regulations on erosion and sediment control and the fulfillment of commitments for erosion and sediment control associated with regulatory and natural resource agencies. In addition, a National Pollutant Discharge Elimination System (NPDES) Storm Water Permit for Construction Activities is required for this project, as described on page 4-27.

In order to minimize impacts to aquatic biota during the construction phase and prevent impacts to water quality, temporary and permanent erosion and sediment control measures will be implemented at sites with areas of exposed soils. Potential impacts to fish will be further reduced by conducting any in-stream work outside of the fish spawning periods, approximately April through July. During construction, the crossing of streams by construction vehicles will be in accordance with current IDOT standards and special provisions. **The project is not expected to exceed the potential TMDL program goals of the impaired streams in the project area. With regards to the Galena River, the designated uses (aquatic life, fish consumption, swimming) impairments are potentially caused by pH, PCB's, pathogens, suspended solids, and habitat alterations (other than flow). The potential sources of these impairments are from agriculture, urban runoff/storm sewers, channelization, and unknown sources. The proposed construction of a bridge over the Galena River will not contribute to the above-mentioned impairments. Potential highway impacts are not associated with pH, PCB's, pathogens, or suspended solids. Habitat alteration of the Galena River will consist of permanent loss of trees along the banks of the river (area under the bridge) and pier placement within the river (loss of substrate). Temporary impacts will occur with placement and removal of clean, aggregate material to be used in causeways across the river for construction equipment. Once construction has been**



completed the river bed will return to its original conditions. The roadway drainage system will consist of open, vegetated ditches. No storm sewers/urban runoff will be associated with the roadway. The Apple River and Yellow Creek are impaired by pathogens from unknown sources. The project will not contribute to a potential increase in pathogens. The Pecatonica River is not crossed by the project. The project is not expected to exceed the potential TMDL program goals for these three streams.

- **Apple River Crossings**

The proposed crossing of the Apple River, a candidate National Wild and Scenic River, will be dual bridges spanning the river and nearby Apple River Road. One bridge will carry two eastbound lanes of traffic, and the adjacent structure will carry two westbound lanes of traffic. It is anticipated that the substructure units for both bridges will consist of open abutments protected by wire reinforced concrete slopewalls and seven reinforced concrete piers. It is anticipated that the two easternmost piers will extend parallel along each bank of the Apple River straddling the river. These piers may be outside or within the waterway. Final design criteria will determine the exact locations. The remaining five piers west of the Apple River will likely be within the river's floodplain.

The final overall bridge lengths, number of spans, number and types of substructure units will be determined during the final design phase. The bridges will be designed to avoid and minimize impacts to the **free flow condition**, scenic and recreational values of the Apple River.

Operational Impacts

Vehicles, dustfall, and precipitation are the major sources of pollutants that accumulate on roadway surfaces, median areas, and adjoining rights-of-way during operation and that are constituents of highway stormwater runoff (FHWA 1996). FHWA-sponsored research has demonstrated the key factor in highway runoff pollutant loadings is impervious surface area (FHWA 1990).

Studies by the FHWA indicate that pollutants in highway runoff are not present in amounts sufficient to threaten surface water or groundwater quality where the average daily traffic (ADT) is less than 30,000. Recent research by FHWA (RD-88-006-9) concluded that paved rural roadways with ADT under 30,000 had only minor impacts, if any, on the water quality of the receiving waters. The proposed Alternates have a projected ADT ranging from 11,600 to 20,000, **with the percentage of trucks ranging from 6.3 to 9.2**, in the year 2020.

The IEPA has assessed surface water quality in the project area. IEPA Use Assessment criteria indicate that most of the streams in the project area are in Full Use. The impact of existing roadway runoff to existing surface water quality in project area watersheds is small and not adverse. It is not anticipated that increases in impervious surface area due to the proposed project will adversely impact surface water quality.

Although adverse impacts to surface water quality are not expected, features are incorporated into the roadway design that will reduce stormwater runoff loadings. Proposed designs include grassed medians and roadside ditches. These features will reduce pollutant loadings to nearby waterways. FHWA (1996) states that, in general, a well-designed, well-maintained grassed swale system can remove 70 percent total suspended solids, 30 percent total phosphorus, and 50 to 90 percent trace metals.



Maintenance Impacts

- **Deicing Salt**

Deicing salt, along with plowing and sanding, are seasonal tools for highway snow and ice control. Deicing salt produces important public mobility and safety benefits by rapidly and reliably providing more drivable and less hazardous road conditions during the winter months.

Surface runoff is the primary mode of road salt removal. Runoff from the roadway and adjacent right of way is directed to the highway drainage system before outletting into a stream. Potential impacts of deicing salt from highway runoff include effects on stream water quality and aquatic biota.

Water quality data for area streams indicated that the existing annual chloride levels of the streams in the project area range from 5 to 50 parts per million (ppm). The state water quality standard for chloride is 500 ppm.

The proposed project would increase the number of lane-miles in the project area, thereby increasing the total salt loading over current levels. This would result in an increase in the delivery of chloride ions to the streams in the project area. **However, roadside ditches will be placed to avoid discharges into karst features (sink holes, bedrock fractures).** This increase would range from three to 22 ppm, depending on the stream size and the intensity and frequency of winter storm events.

These impacts are considered seasonal and should not create violations to state water quality standards (chloride and aquatic life).

- **Herbicides**

Operational impacts also include the application of herbicide. The herbicides Tordon 101, Garlon 34, and Vanquish are currently used for control of noxious and nuisance weeds. These herbicides are used for spot spraying applications. Only one type of herbicide is actually applied to any given spot within a year.

Impacts caused by weed spray applications are considered minor. Spraying is not allowed at stream crossings, ponds or other water bodies crossing or adjacent to the highway right of way.

Spraying is prohibited within 150 feet of a state listed Natural Area or an occurrence of threatened or endangered species. Areas proposed for weed spraying are coordinated with the Illinois DNR.

Permits

Permits include the U.S. Army Corps of Engineers' (Corps) Section 404 permit, IEPA Water Quality Certification, and the IDNR Water Resource Permit. Under Section 404 of the Clean Water Act, the Corps regulates the discharge of dredged and fill material into waters of the United States, including wetlands. The Corps issues either an Individual or a Nationwide permit. An Individual Permit is usually required for potentially substantial impacts, whereas Nationwide Permits allow for minor impacts, provided specific conditions to minimize impacts are met. However, for most road crossing discharges with only minimal adverse effects, the Corps often grants an up-front Nationwide Permit 14. The IEPA Water Quality Certification provides for the protection of water quality through Section 401 of the Clean Water Act for activities that involve



the placement of fill within wetlands and surface waters. The IEPA has provided blanket certification for National Permit 14, but requires individual certification for Individual Section 404 permits and Nationwide Permit 33.

It is anticipated that the Preferred Alternate will result in the disturbance of 0.4 or more hectares (one or more acres) of total land area. Accordingly, it is subject to the requirement for a (NPDES) permit for stormwater discharges from the construction sites. Permit coverage for the project will be obtained either under the IEPA General Permit for Stormwater Discharges from Construction Site Activities (NPDES Permit No. ILR10) or under an individual NPDES permit.

In conjunction with the NPDES Storm Water Permit for Construction Site Activities required for this project, a Storm Water Pollution Prevention Plan will be developed. Such a plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges from the construction site. This plan shall describe and ensure the implementation of practices, which will be used to reduce the pollutants in discharges associated with construction site activity and to assure compliance with the terms of the permit.

4.8 Floodplains

A total of eight transverse crossings and four longitudinal crossings will result from the Preferred Alternate. The Preferred Alternate (Alternate 2) crosses the Galena River, Smallpox Creek, Furnace Creek (two encroachments), Apple River, Yellow Creek Tributary A, Yellow Creek (two encroachments), Yellow Creek Tributary D (3 encroachments) and Pecatonica River Tributary. Of the 12 encroachments, eight will involve the construction of bridges (Galena River, Smallpox Creek – 2 locations, Furnace Creek, Apple River, Yellow Creek Tributary A, Yellow Creek – 2 locations) within the floodplain. The permanent work in the floodplain involves the placement of bridge piers and roadway embankment. These areas and volumes are depicted in Table 4-11. Temporary fills will consist of causeways and will be removed and disposed of outside the floodplain. Four encroachments involve no structures. These encroachments involve the placement of roadway embankment at the margins of the floodplains of Yellow Creek Tributary D (three areas) and the Unnamed Tributary to the Pecatonica River. A summary of the impacts at each crossing location by the Preferred Alternate is provided in Table 4-11, and a summary of the impacts by the Preferred Alternate in comparison to the Alternates evaluated in the DEIS, please see Section 4.8, is provided in Table 4-12. There are no regulatory floodways in the project area.

The floodplains in the project area are mostly agricultural in nature. Cover types within the floodplains are dominated by pasture, hayfield and agricultural land. These cover types provide beneficial floodplain values with regard to agricultural production, some wildlife support, and flood moderation. As stormwater tops the banks of a river or stream and spreads out over the floodplain, the flow velocity decreases and the storm peak is reduced. This helps to alleviate the impact of flooding downstream. With the flow velocity decreased the amount of bank erosion also decreases. The floodplains in somewhat natural condition provide nesting and foraging habitat and cover for wildlife.

In accordance with the intent of federal Executive Order 11988 on floodplain management, efforts have been made to minimize floodplain impacts. The longitudinal floodplain encroachments for each alternate are unavoidable. Attempts to minimize the unavoidable longitudinal encroachment impacts are explained below.



TABLE 4-11
FEMA 100-YEAR FLOODPLAIN IMPACTS – PREFERRED ALTERNATE

Section	Sheet No.	Stream	Embankment Area M ² (Ft ²)	Piers Area M ² (Ft ²)	Total Area M ² (Ft ²)	Approximate Volume of Fill M ³ (Ft ³)	Crossing Type
A-B	5	Galena River	0	162 (1,742)	162 (1,742)	394 (13,914)	Transverse
B-F	9,10	Smallpox Creek	0	81 (871)	81 (871)	123 (4,344)	Transverse
B-F	8,29	Furnace Creek (IL 84 extended)	0	121 (1,307)	121 (1,307)	74 (2,613)	Transverse
B-F	30	Furnace Creek	3,440 (37,026)	162 (1,742)	3,602 (38,769)	4,012 (141,682)	Transverse
H-J	32	Apple River	0	202 (2,178)	202 (2,178)	1,541 (54,420)	Transverse
H-J	93	Tributary A to Yellow Creek	1,295 (13,939)	81 (871)	1,376 (14,810)	665 (23,484)	Transverse
H-J	94	Yellow Creek	2,995 (32,235)	202 (2,178)	3,197 (34,413)	1,102 (38,952)	Transverse
H-J	94	Yellow Creek (Steers Road)	8,417 (90,600)	0	8,417 (90,600)	25,820 (911,800)	Transverse
H-J	94	Tributary D to Yellow Creek	405 (4,356)	0	405 (4,356)	863 (30,477)	Longitudinal
H-J	94	Tributary D to Yellow Creek	2,792 (30,057)	0	2,792 (30,057)	1,701 (60,070)	Longitudinal
H-J	94	Tributary D to Yellow Creek	405 (4,346)	0	405 (4,356)	247 (8,723)	Longitudinal
J-K	114	Unnamed Tributary to Pecatonica River (AYP Road)	9,955 (107,158)	0	9,955 (107,158)	6,065 (214,184)	Longitudinal - TCE
TOTAL			29,704 (319,717)	1,011 (10,889)	30,715 (330,617)	42,607 (1,504,663)	12 Crossings

Note: The above-referenced sheets are contained in the Exhibits as part of the DEIS.
Source: The Louis Berger Group, Inc., 2002.

TABLE 4-12
100-YEAR FLOODPLAIN IMPACTS BY ALTERNATE

Alternate	Number of Crossings	Embankment Area M ² (Ft ²)	Piers Area M ² (Ft ²)	Total Area M ² (Ft ²)	Approximate Volume of Fill M ³ (Ft ³)
1	12	29,704 (319,717)	1,011 (10,889)	30,715 (330,617)	42,607 (1,504,663)
2	12	29,704 (319,717)	1,011 (10,889)	30,715 (330,617)	42,607 (1,504,663)
3	11	31,928 (343,670)	768 (8,267)	32,697 (351,948)	45,140 (1,594,079)
4	11	31,928 (343,670)	768 (8,267)	32,697 (351,948)	45,140 (1,594,079)
5	11	31,928 (343,670)	768 (8,267)	32,697 (351,948)	45,140 (1,594,079)
6	11	31,928 (343,670)	768 (8,267)	32,697 (351,948)	45,140 (1,594,079)
7	11	30,350 (326,685)	808 (8,697)	31,159 (335,393)	42,959 (1,517,058)
8	11	30,350 (326,685)	808 (8,697)	31,159 (335,393)	42,959 (1,517,058)
9	11	30,350 (326,685)	808 (8,697)	31,159 (335,393)	42,959 (1,517,058)
10	11	30,350 (326,685)	808 (8,697)	31,159 (335,393)	42,959 (1,517,058)
11	10	34,113 (367,189)	483 (5,199)	34,596 (372,388)	19,491 (688,318)
12	10	41,478 (446,466)	483 (5,199)	41,961 (451,664)	23,978 (846,775)

Source: The Louis Berger Group, Inc., 2002.

Note: The Preferred Alternate is highlighted.



In Section H-J, there are three separate longitudinal encroachments of the Yellow Creek Tributary D floodplain because of locating the Alternate along property lines. The alignment was established to minimize farm severance and disruption to residences and businesses along the entire route. Between stations 4050 and 4575, the proposed alignment shifts to the north to minimize the severance to an existing farm, avoid the farmstead and minimize floodplain impacts. Moving the alignment entirely out of the floodplain would affect the farmstead as well as access to the farmstead from Stees Road. Therefore, the balance between impacts to the farm and farmstead and the encroachment into the floodplain of a tributary to Yellow Creek was reached with the proposed alignment. The proposed project is not expected to generate incompatible floodplain development, which is closely regulated by the Jo Daviess County Floodplain Ordinance, the Stephenson County Floodplain Ordinance and various state and local regulations and ordinances.

In Section J-K there is a longitudinal encroachment of the unnamed tributary to the Pecatonica River. The existing alignment of Ayp Road is being maintained in this area to minimize impacts to surrounding agricultural properties. The proposed project is not expected to generate incompatible floodplain development, which is closely regulated by state, county and local regulations and ordinances.

A hydraulic analysis was conducted to ensure that floodwater surface elevations of the crossings proposed by the various alternates would not increase floodplain elevations by more than 0.3 meters (1.0 feet) (Berger, July 2001). In addition, the drainage structures proposed in this project will cause a minimal increase in flood heights and flood limits. These minimal increases will not result in any significant adverse impacts on the natural and beneficial floodplain values; they will not result in any significant change in flood risks or damage; and they do not have significant potential for interruption or termination of emergency service or emergency evacuation routes; therefore, it has been determined that the encroachments are not significant.

Individual Permits from the IDNR Department of Water Resources will be needed for development in floodplains. Individual Permits will be needed for a stream that is located in a rural area and the drainage area for the stream is greater than 2,590 hectares (10 sq. miles), a stream that is in urban area and the drainage area of the stream is greater than 259 hectares (1 sq. mile), or any channel realignments.

Only Practicable Alternative Finding

In accordance with Executive Order 11988 (Floodplain Management) and 23 CFR 650, Subpart A (FHWA regulations) the project has been evaluated for floodplain impacts. The project involves eight transverse and four longitudinal floodplain encroachments. Some of the alternatives that were studied avoided the longitudinal encroachments, but these had greater impacts to other environmental features (wetlands, upland forest). The Preferred Alternate (Alternate 2) conforms to all applicable State and local floodplain protection standards. Based on the above considerations, it is determined that there is no practicable alternative to the proposed construction in floodplains, and that the proposed action includes all practicable measures to minimize harm to these resources.



4.9 Wetlands

Impacts to wetlands were identified by overlaying the proposed alignments on the wetland delineation maps. Impacts to wetlands were estimated by digitizing all wetland areas that occur within the project right of way.

Wetland impacts from highway construction were assessed for each of the Alternates that are evaluated in the DEIS (Table 4-11, Section 4.9). Impacts within the highway right of way include vegetation removal, placement of fill, soil compaction, excavation, sedimentation, and changes in wetland hydroperiod and species composition.

The Preferred Alternate has the least number of individual and acreage wetlands impacts. A total of 1.47 hectares (3.63 acres) from nine wetland sites. Alternates 11 and 12 have the most wetland impacts, 26 wetland sites totaling 6.33 to 6.41 hectares (15.64 to 15.84 acres), while the other Alternates (1, 3-10) impact from 11 to 17 wetland sites totaling 1.50 to 3.62 hectares (3.71 to 8.95 acres). Impacts to individual wetland sites are depicted in Table 4-45 (Impacts to Wetlands by Alternative) and Table 4-46 (Summary of Wetland Impacts by Alternate) of the DEIS.

The Preferred Alternate impacts a total of nine wetland sites consisting of four different plant communities. The plant communities consist of four sedge meadows totaling 0.98 hectare (2.40 acres), three wet meadows totaling 0.25 hectare (0.62 acre), one marsh totaling 0.25 hectare (0.61 acre) and one pond totaling 0.01 hectare (0.02 acre). Wetland impacts by alternate, wetland site and plant community are depicted on Table 4-13.

The Preferred Alternate impacts mostly wet and sedge meadows containing floristic quality indices between 4.1 and 20.8. These wetlands are generally located in higher positions of intermittent drainages or first order streams. The principal wetland functions associated with these wetland areas include water quality improvement (nutrient transformation and sediment retention), flood flow alteration (flood storage), and wildlife habitat. The effectiveness of each wetland to provide these situations is dependent upon the wetlands size, landscape position and level of disturbance.

A Section 404 permit from the U.S. Army Corps of Engineers (Rock Island District) will be required at each filled wetland site. Generally, wetland impacts greater than 0.2 hectares (0.5 acres) will require an Individual Section 404 permit. Those sites having impacts less than 0.2 hectares (0.5 acres) will qualify for the Nationwide Permit 14 (linear transportation projects). Water quality certification (Section 401) from Illinois EPA will be required at each impacted wetland site.

Measures to Minimize Harm

The Alternate alignments were developed with the goal of avoiding and minimizing impacts to wetlands and stream channels while at the same time meeting the goals of the purpose and need of the project. Wetland impacts have been minimized to the greatest extent possible at this stage of project design in a manner consistent with the project location criteria.

Further efforts to minimize wetland impacts will be incorporated into the design and construction of the Preferred Alternate (Alternate 2). These measures may include:



TABLE 4-13
IMPACTS TO WETLANDS BY ALTERNATE
(in hectares)

Wetland No.	1	2	3	4	5	6	7	8	9	10	11	12	Wetland Cover Type	
4	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10		0.10	Wet Meadow	
15											0.06	0.06	Sedge Meadow	
17											0.09	0.09	Wet Meadow	
20											0.89	0.89	Sedge Meadow	
23											0.07	0.07	Wet Meadow	
24	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			Sedge Meadow	
25	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11			Wet Meadow	
29											0.11	0.11	Wet Meadow	
31											0.10	0.10	Wet Meadow	
51	0.02		0.02		0.02		0.02	0.02			0.02	0.02	Wet Meadow	
55											0.06	0.06	Marsh	
56											0.01	0.01	Wet Meadow	
57											0.02	0.02	Pond	
58											0.06	0.06	Sedge Meadow	
68											0.20	0.20	Wet Meadow	
69											0.58	0.58	Sedge Meadow	
71											0.12	0.12	Sedge Meadow	
79											0.05	0.05	Wet Meadow	
83	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03			Wet Meadow	
94					0.04	0.04		0.04		0.04			Pond	
118	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	Sedge Meadow	
120	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Pond	
164			0.06	0.06	0.06	0.06							Wet Meadow	
168			0.21	0.21	0.21	0.21							Sedge Meadow	
178			0.75	0.75	0.75	0.75							Sedge Meadow	
185											0.37	0.37	Wet Meadow	
196			0.01	0.01			0.01						Sedge Meadow	
209	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	Sedge Meadow	
1s											0.02		Wet Meadow	
2s											0.65	0.65	Sedge Meadow	
3s											0.05	0.05	Wet Meadow	
5s	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25			Sedge Meadow	
6s	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25			Marsh	
10s							1.30	1.30	1.30	1.30	1.30	1.30	Sedge Meadow	
11s			0.79	0.79	0.79	0.79							Wet Meadow	
17s							0.36	0.36	0.36	0.36	0.36	0.36	Pond	
18s							0.42	0.42	0.42	0.42	0.42	0.42	Wet Meadow	
19s			0.15	0.15	0.15	0.15							Sedge Meadow	
TOTALS	Hectares	1.49	1.47	3.46	3.44	3.49	3.47	3.58	3.61	3.55	3.59	6.32	6.40	
	Acres	3.68	3.63	8.55	8.50	8.62	8.57	8.85	8.92	8.77	8.87	15.62	15.81	

Source: The Louis Berger Group, Inc., 2002. Note: The Preferred Alternate is highlighted.

- To the maximum extent possible, existing surface water drainage patterns will be maintained through the installation of pipes and culverts to maintain surface flows to wetland areas;
- Outlets of storm drains will be designed to minimize outlet velocities that might otherwise cause erosion and sedimentation;
- Excavation and filling operations will be conducted in a manner to minimize turbidity and sedimentation in the wetlands and natural watercourses. Placement of road embankments (filling) will be conducted in such a manner as to contain sediment at the fill area;
- The limits of the fill activity will be indicated on the final design plans and will be the absolute minimum necessary for the construction of the roadway;



- Equipment storage, temporary roads and stockpile areas will not be permitted within wetlands or adjacent to stream channels; any area proposed for use as a contractor-use-area will require a survey for identification of biological, cultural, and natural resource areas.
- A detailed soil erosion and sediment/stormwater control plan will be developed as an integral part of the construction plans. Emphasis will be given to the prevention of sediments from entering into wetlands and streams.

Wetland Mitigation

Mitigation for wetland impacts will follow the Department's Wetlands Action Plan as approved by the IDNR under the Illinois Interagency Wetland Policy Act and its implementing regulations. Under the State policy, all wetland impacts must be mitigated. State mitigation ratios are identified in the rules and are determined by the size of impact (over or under 0.5 acres) and the location of the mitigation site (on-site, off-site or out-of-basin). **The project is being processed as a standard action under the IDOT Wetlands Action Plan. This means that the project requires a compensation plan and that the project has to be coordinated with the IDNR. The compensation plan is to purchase credits from a wetland bank. This coordination took place with the circulation of the Draft EIS. The IDNR (letter dated July 18, 2003, Appendix) concurred that the project is in compliance with the Illinois Interagency Wetland Policy Act.**

The project is approximately 47 miles in length and crosses approximately 28 local watersheds. These local watersheds are part of two major watershed systems, the upper Mississippi River Basin and the Rock River Basin. The nine wetland sites occur in 5 different local basins. The individual wetland impacts are small in size. The restoration or construction of wetlands in each local watershed is not ecologically sound. Regulations allow the Department to consolidate wetland impacts at larger sites (wetland banks). The IDNR letter of July 18, 2003, concurred with the use of a bank site.

Wetland mitigation for this project will be carried out by the purchase of the required credits from the Kilbuck Creek Wetland Mitigation Bank site just south of Rockford, Illinois. Bank sites are created specifically for the purpose of wetland mitigation. Wetland banking provides for the consolidation of small wetland impacts into larger parcels, which have more ecological value and are more manageable.

The applicable mitigation ratios based on the use of Kilbuck Creek Mitigation bank are 2.0 to 1.0 (sites 4, 24, 25), 3.0 to 1.0 (sites 83 and 120), and 5.5 to 1.0 (sites 118, 209, 5S, and 6S). The total mitigation required for the Preferred Alternate is **7.18 hectares (17.75 acres)**.

Only Practicable Alternative Finding

This statement sets forth the basis for a finding that there is no practicable alternative to construction in the wetlands located along the project area. This finding is made in accordance with the requirements of Executive Order 11990 on the Protection of Wetlands dated May 24, 1977.

The project description, the description of wetlands, and wetlands affected are covered in the appropriate sections of the EIS. The Preferred Alignment (alternate 2) has the least number and acreage of wetland impacts. A total of nine wetland sites with the loss of 1.47 hectares (3.63 acres) will be affected. Measures to minimize harm to wetlands is outlined in the above Section. The draft EIS has been coordinated with federal and state agencies and the public. Two responses were received; the IDNR concurred with the



proposal and a member of the public believed mitigation should be done in the local watershed. Wetland mitigation is being proposed at a wetland bank. A total of 7.18 hectares (17.75 acres) of wetland credits will be purchased.

The above factors and considerations establish that there is no practicable alternative to construction in the wetlands of the project area, and that the highway proposal includes all practicable measures to minimize harm to the wetlands which may result from such use.

4.10 Special Waste

Alternate 2 (Preferred Alternate) will not involve nor impact any CERCLIS sites nor other sites potentially impacted with regulated substances.

4.11 Types of Permits

Federal – Section 404

Certain activities in the streams of the project area may require a Section 404 permit from the USACOE for the discharge of dredged or fill material into waters of the United States. The Corps issues either an Individual or Nationwide Permit. An Individual Permit is usually required for potentially substantial impacts.

State

Section 401 Water Quality Certification

All Section 404 permits require a Section 401 Water Quality Certification review by the IEPA. IEPA must approve or waive the water quality certification as a condition for issuance of an Individual Section 404 permit or for use of a Nationwide Section 404 permit.

Section 402 National Pollutant Discharge Elimination System Construction Permit

This project will result in the disturbance of two or more hectares (five acres) of total land area. Accordingly, it is subject to the requirement for a Section 402 National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges from construction sites. Permit coverage for the project will be obtained either under the IEPA General Permit for Stormwater Discharges from Construction Site Activities (NPDES Permit No. ILR10) or under an individual NPDES permit.

Construction in Floodways of Rivers, Lakes, and Streams Permit

A permit for construction in regulatory floodways and public waters will need to be obtained from the Illinois Department of Natural Resources, Office of Water Resources. This permit is required for construction in the floodway of streams serving a tributary area of 259 hectares (640 acres) or more in an urban area or 2,590 hectares (6,400 acres) or more in a rural area.

Groundwater Management

Project related activities may be restricted in regulatory setback zones. IEPA has jurisdiction over setback zone restrictions and will need to be consulted regarding applicability for this



project. Proposed project related activities may be considered new potential sources of contamination. Waivers and exceptions to minimum setback zone prohibitions can be acquired.

Burning/Disposal Permits

A permit shall be obtained from IEPA prior to open burning of organic waste (i.e., plant refuse resulting from pruning or removal of trees/shrubs) or other construction or demolition debris. Organic waste originating within the right-of-way limits may be chipped or shredded and placed as mulch around landscape plantings within the right of way (IDOT 2001).

Demolition of Structures

IEPA requires notification of demolition and renovation of structures. As the proposed project will require building demolition, appropriate notifications and coordination will be required.

State Historic Preservation Office Approval

Archaeological and historical surveys were conducted as part of the project compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. State Historic Preservation Office coordination is provided in Appendix E of the DEIS.

Local

Groundwater Management

Local communities enforce nonregulatory groundwater management practices such as activity restrictions within Wellhead Protection Areas and zoning ordinances. Local communities will need to be consulted regarding the applicability of the proposed project.

4.12 Visual/Aesthetics

The alignment of the Preferred Alternate has been developed by taking into consideration the visual resource class objectives, as defined in Section 2.14 of the DEIS. The areas in which these objectives have not been met are generally found in Landscape Zone 1 (Upland Hills and Ridges) where topographic variation requires the use of structures and where the visual resource objectives are more demanding. In Landscape Zone 2 (Rolling Hills and Valleys) and Landscape Zone 3 (Illinois Prairie) most of the objectives are met except where drainage requires the use of small bridges and culverts.

Impact reduction measures will be considered where deemed practical and feasible in the final design of the Preferred Alternate.

The proposed project offers great potential for the inclusion of mitigation measures that allow for the improvement of U.S. Route 20 while blending into the existing landscape. The Preferred Alternate will be designed in such a manner as to create a scenic highway that compliments the visual character of the project area.

Apple River

The Apple River is listed as a candidate Wild and Scenic River by the National Park Service based on its Outstandingly Remarkable Values (ORV's). These ORV's include the rivers scenic, recreational, and geologic attributes. To determine potential project



impacts on these values we have chosen to look at the section of the river one-mile either side of the proposed crossing. We have considered both short-term (construction) and long-term (operational) impacts to these attributes.

During construction of the bridges, a causeway 40-feet in width will be used by construction equipment. It is expected that it will take two years to build the bridges and that causeways will be in place during that time. At that time, canoeing or floating on the river will be interrupted. This potential impact is considered minor and temporary.

After construction and during operation of the highway the scenic view from the river will be changed. Canoers, floaters, and anglers will see and hear activity associated with the bridge. An impact to the bluffs on either side of the Apple River will occur, as the proposed roadway will be embedded within the eastern bluff by 30 feet. On the west side, there will be approximately 1100 feet of fill placed from the margin of the floodplain to the bluff. As the roadway merges into the bluff it will transition into a 40-foot long cut through the bluff. This may be considered detrimental to the view and is considered a long-term impact. The view of the river from the new road is obscured by the common use of parapet walls instead of railing. Therefore, the scenic view from the bridge will not be available unless a more open bridge design is used. These potential negative impacts could be reduced by using a scenic bridge design, landscaping, and planting woody riparian vegetation in the adjacent Apple River floodplain.

Lighting

Project impacts on dark skies is limited. Lighting for the project will be established only at the eight interchanges. At these interchanges only partial interchange lighting will be installed. Lighting would occur at both ramp gores along U.S. Route 20 and at the ramp terminal intersections. The bridges over U.S. Route 20 at these interchange locations would also be lighted. The Department is considering "full cutoff" lighting that directs light only to locations where it is needed. The lighting will be on poles between 9 to 19.8 m (30 feet to 65 feet) in height. The lighting (lamps) will be high-pressure sodium (HPS). HPS lamps have excellent luminous efficiency, power usage, and long life. The HPS lamp produces a soft, pinkish-yellow light. This potential impact is considered minor but long-term.

4.13 Construction Impacts

Social

Short-term minor impacts to the traveling public and businesses adjacent to the construction sites are anticipated during the various phases of construction. However, for the most part, motorized and pedestrian traffic should not experience undue hardship as a result of construction activities.

The proposed project will result in the acquisition and displacement of several residences, farmsteads and business properties. Although the acquisition, demolition and relocation/reconstruction of these properties will occur prior to and during the construction phase, these impacts are considered to be long term, permanent and associated with both the construction and operation of the proposed project.



Air Quality

The primary potential impact on air quality from construction will be fugitive dust (particulate) resulting from soil exposed to wind and traffic. The quantity of fugitive dust from construction activities varies depending on the area of land being worked, the level of activity, the soil silt content, the soil moisture, and wind speed. While the contribution of the proposed project to the total suspended particulates in the surrounding area will be small and of a short-term duration, the construction will generate fugitive dust that may be a nuisance in nearby areas.

The Department has established a Special Provision for particulate matter impacts as described in the *Standard Specifications for Road and Bridge Construction, Section 107.36, Dust Control*. Under this provision, the dust and air-borne dirt generated by construction activities will be controlled under dust control procedures for a specific plan. The construction contractor and the Department will meet to review the nature and extent of dust generating activities and cooperatively develop specific types of control techniques to that specific situation. Sample techniques include such measures as minimizing tracking out of soil onto nearby publicly traveled roads, reducing vehicle speed on unpaved surfaces, covering haul vehicles and applying chemical dust suppressants or water to exposed surfaces, particularly to surfaces on which construction vehicles travel.

Noise

Trucks and heavy machinery used during construction will generate noise, which may affect some land use activities. However, because of the rural and agricultural character of the project area, these impacts will be minimal. In addition, specifications concerning construction noise as outlined in Article 107.35 of the Department's *Standard Specifications for Road and Bridge Construction* as adopted January 1, 2002, requires all machinery to be equipped with proper mufflers and that construction be limited to the period between 7:00 A.M. and 10:00 P.M. (within close proximity to sensitive receptors). These provisions also require contractors to observe and comply with all federal, state and local laws and all ordinances and regulations, which in any manner affect the conduct of the work.

Disposal and Borrow Pits

The proposed project will require fill, particularly for the elevated portions of the roadway and roadway embankments. Some of the fill material will be borrowed from those portions of the roadway where excavation may occur. Sources of additional fill, which will not be available from excavation, will come from one or more borrow pits that may be located within and adjacent to the project area. Limited disposal of fill resulting from excavation is anticipated. Any borrow source which might be considered for the proposed project will be archaeologically surveyed, surveyed for threatened and endangered species and wetlands and cleared prior to such use. The location and use of all borrow and disposal pits will follow the requirements and specifications as set forth in the Department's *Standard Specifications for Road and Bridge Construction*.

Temporary Access

Access to all properties will be maintained by staged construction temporary access roads, or other appropriate means. These measures will minimize inconvenience and financial loss resulting from construction activities. Coordination with local public officials and law enforcement groups will serve to limit any long term or adverse impacts to local circulation patterns during the construction period.



Utilities

Roadway construction could require the temporary or permanent relocation of utilities along the project corridor including; water supply, storm water collection, sewer collection and electrical, gas and oil distribution and transmission. Construction activities will be coordinated with public utilities in order to avoid crashes and minimize planned interruptions and service. When service interruptions are unavoidable, every effort will be made to limit their duration. Coordination of construction activities with local utility officials and the implementation of staged construction would ensure that continuous service is provided to local area residents.

Traffic and Circulation

Construction of the proposed project would occur in various construction stages for up to a fifteen-year duration. This construction could result in short-term impacts to local area residents and other users of U.S. Route 20, Illinois Routes 84, 78 and 73 and local roads throughout the project area. Potential short term impacts could include; detours, temporary congestion and longer travel times through the project area. A construction phasing plan and appropriate traffic control plan would be developed where needed as part of the final design to coordinate construction activities and minimize disruption of traffic flow and impacts for local residents and businesses. In addition, public awareness programs to inform local residents and motorists about potential construction delays and alternate travel opportunities would be implemented by the Department in cooperation with local officials.

Floodplains

During the construction phase, there is the potential for erosion of unprotected embankments from surface runoff and a risk of damage to unfinished drainage structures should flooding occur. Increased sediment deposition in creeks and rivers downstream is an associated impact. Best Management Practices will be employed to limit any potential for impact to the local creeks, streams and rivers which comprise the project area flood plains. In addition, all construction will be conducted pursuant the latest standards and guidelines as specified in the Department's *Standard Specifications for Road and Bridge Construction*.

Water Quality

The construction of the proposed project is not expected to result in any severe impacts to surface and subsurface water quality in the project area. Short-term increases in sedimentation and turbidity levels within surface water resources may be expected during construction in proportion to the proximity of excavated sites to surface water and the frequency of storms. However, turbidity and sedimentation are expected to return to baseline levels soon after construction. Temporary erosion and siltation control measures will be employed as needed to minimize silt loading and deposition in the nearby creeks, streams and rivers. Erosion control measures are specified in the Department's *Standard Specifications for Road and Bridge Construction* and recurring Special Provisions. These measures will be incorporated as part of the construction plans. Areas of high erosion potential will be identified during project design. Necessary erosion control measures will be incorporated into the construction plans as well.

Special Waste

The construction of the proposed project will require the excavation and disturbance of surface and subsurface soils. All appropriate measures will be taken to limit the potential for any



seepage of petroleum products from construction equipment into the local surface waters and drainage areas.

Solid Waste

Responsible construction practices will be followed to keep solid waste at a minimum through proper collection and treatment of waste material. Common disposal measures include hauling to landfills or open burning. Contractors must comply with all federal, state and local laws, ordinances and regulations. Open burning of landscape waste will require a permit from the Illinois EPA.

Cultural Resources

All construction activities, including but not restricted to access roads, construction camps, staging areas, maintenance areas, pipelines, detours, power lines, material storage areas and sources, waste and dump areas, etc., will be restricted to the cleared right of way prior to such use. This action is in keeping with federal regulations, which preclude the destruction of cultural resources when federal funds are involved. These actions shall serve to limit any potential impacts to cultural resources outside of the right of way.

4.14 Secondary and Cumulative Impacts

Secondary Impacts

One of the primary purposes of the proposed project is to provide a transportation facility that properly addresses existing and projected system deficiencies, and seeks to improve safety and efficiency. The growth of employment and tourism in the project area, plus increased truck traffic, and increased use of automobiles within the region, has led to traffic overcrowding and safety problems at several locations along this part of U.S. Route 20.

Induced development issues addressed below concern the degree to which the proposed project may influence development patterns at the regional and local levels.

- **Induced Regional Development**

In the project area, there are trends operating which may be as important, or more important, than highway accessibility. The most important of these trends is the attractiveness of Galena for tourism and the second-home market. This is counterbalanced by the long-term tendency of population and employment to remain static in Jo Daviess and Stephenson Counties. In this situation, several scenarios are possible. The proposed project could enhance the region's growth prospects because it facilitates travel here by tourists; or, growth could continue to be depressed by static population and employment, in spite of the improvements.

Another possible scenario is that the failure to implement the proposed project could negatively influence development: increased traffic congestion and crashes on U.S. Route 20 could have an inhibiting effect, making the area less attractive to businesses, tourists and second-home owners. In this scenario, there could be reduced or even negative growth. This scenario is a reasonable possibility, based on the perceptions of local business people and officials, as elicited in two recent surveys.

The proposed project may allow existing and projected development trends to continue as currently foreseen, rather than extensively altering them. If the proposed project is not



constructed, the limitations of the existing U.S. Route 20 may serve to limit future growth and development.

- **Induced Local Development**

Local development in connection with a new limited- or controlled-access highway may under certain conditions be expected to take place in the vicinity of interchanges. Research has been conducted concerning some specific types of land uses that might be expected to develop near rural interchanges. Other research concerns highway-related developments such as larger commercial land uses, including shopping centers and so-called “big-box” stores offering a variety of merchandise, and industrial and warehousing land uses. The proposed project is not expected to result in any considerable local induced development. The local land use regulations will serve to limit the potential for induced local development along and adjacent to the alignment and interchanges of the Preferred Alternate. Further detailed information regarding induced development is provided in Section 4.14 of the DEIS.

In local areas economic development growth can be encouraged by promoting local assets and ensuring a low cost and reliable regulatory process. Desirable development can be guided into growth areas using local land use planning and regulations and highway access controls. Undesirable forms of development can also be regulated through careful planning and land use regulation.

Cumulative Impacts

To assess cumulative impacts, other projects were considered to determine if they would change the impacts of the proposed project. Two types of projects were considered: highways and utility extensions. Either of these, depending on their location and size, could potentially alter the impacts of the proposed project.

- **Highway Projects**

The Transportation Improvement Programs (TIPs) of Illinois and Iowa were reviewed to determine if there are planned highway projects that could have an effect on U.S. Route 20. The TIPs contain schedules for transportation facility construction between 1999 and 2003, and also include planning studies and discussions of projects farther into the future.

Except for the proposed project, no other major highway capacity expansions are planned in the northwestern part of the state by the Department. Bridge replacements and resurfacings are planned on I-80 and I-74 in the Moline area, which will facilitate traffic movement in this key goods movement corridor. Resurfacing is also planned for the U.S. Route 20 bypass south of Rockford. None of these improvements, however, will add substantial traffic capacity.

Other major highway projects throughout Illinois were also considered. The majority of these improvements are in the resurfacing and reconstruction categories. The major capacity expansion projects are all located in distant parts of the state, and would have little impact on traffic along U.S. Route 20.

Several projects in Iowa could affect traffic on U.S. Route 20:

- *Bypass and New Mississippi River Bridge in Dubuque:* These improvements would extend from U.S. Route 20 west of Dubuque, crossing the Mississippi River and tying back into U.S. Route 20 in Jo Daviess County. Functioning as a bypass south of Dubuque, they would



relieve the current bottleneck where U.S. Route 20 passes through Dubuque. These projects are in the planning stage at present, and are not scheduled in the Iowa TIP.

- *U.S. Route 151 Corridor between Dubuque and Cedar Rapids:* U.S. Route 151 is being expanded to four lanes in this area. This could facilitate additional traffic movement between U.S. Route 20 in Illinois and Des Moines. The improvements are scheduled for completion in 2003.
- *The "Avenue of the Saints":* This project is intended to connect the Twin Cities in Minnesota to St. Louis with a four-lane highway. Part of the project between Waterloo and Mason City, IA, an expansion of U.S. Routes 18 and 218 to four lanes, including by-passes of towns along the route, is scheduled for completion in 2003. This will provide additional traffic capacity from U.S. Route 20 in Waterloo to the I-35 corridor heading toward the Twin Cities.
- *U.S. Route 20 four-lane route across Iowa:* Plans call for making U.S. Route 20 entirely a four-lane highway crossing Iowa from Dubuque to Sioux City. A key link in this plan is the construction of about 64 kilometers (40 miles) of new four-lane highway between Waterloo and I-35, to be completed in 2004.

The completion of these projects comprises part of Iowa's "Commercial and Industrial Network", which is intended to "support economic development through transportation investments"⁹. The primary impact of these projects would be to facilitate goods movement, and hence truck traffic, along these routes, as noted above. All of the above projects tie into U.S. Route 20 in Illinois, and could facilitate truck movement to markets in Des Moines and west, and the Twin Cities and west, perhaps making U.S. Route 20 through the project area more attractive to truck depots and warehouses, thus increasing truck traffic.

However, there are several factors which will probably act to delay, or reduce, this impact. First, an important link in the Iowa network is the bypass south of Dubuque and the Mississippi River bridge. These projects are being planned now, and must pass through a NEPA EIS review before construction can start. Allowing five years for construction in addition to the review period would place completion of these projects into the indefinite future, perhaps even beyond the planning horizon for the U.S. Route 20 improvements (2020). Second, the I-80 corridor is the established east-west goods movement route in this region of the U.S. Increased congestion or highway deterioration on I-80 would be required to divert truck traffic from this corridor. By scheduling maintenance projects on I-80, the Department is taking measures to prevent this from happening. Third, I-90, the principal westerly route from Chicago to the U.S. Route 20 corridor, is a toll road. This can be a discouragement to truck traffic.

In view of this, considerable cumulative highway impacts associated with the proposed project are considered unlikely in the foreseeable future.

- **Air Quality**

No cumulative air quality impacts are anticipated. Since the proposed project will be phased construction and will be constructed independent of the other planned roadway projects, no construction related cumulative impacts are anticipated.

⁹ Iowa Department of Transportation, *1999-2003 Iowa Transportation Improvement Program*, 1999.



- **Noise**

Although some increased noise levels are anticipated within the project area from the operation of the proposed project, no cumulative or secondary impacts are anticipated. These proposed transportation projects are being considered by the States of Illinois and Iowa independently of the proposed project. Since the predicted future noise levels associated with the project considered the future traffic volumes of these planned improvements along with the proposed project, no secondary or cumulative impacts are anticipated.

- **Groundwater/Water Quality/Floodplains**

The proposed project along with the other proposed roadway improvements within and to the east and west of the project corridor will contribute in some measure to the loading of groundwater and nearby drainage areas with sediments and chemical pollutants. This impact will result from the paving of surface area and increase in impervious hectares (acres) in the project area. Where at all possible, Best Management Practices will be employed during construction. In addition, all construction activity will be conducted pursuant to the requirements as set forth in Section 107.01 of the Department's *Standard Specifications for Road and Bridge Construction* as well as the monitoring and guidance standards as set forth in the Department Water Quality Manual. Groundwater impacts would be localized without any cumulative impacts.

Water resources may also be affected by the volume and quality of runoff from secondary developments. Local storm water ordinances often require compensatory storage at rates greater than 1:1 for flood plain encroachments, thus actually increasing the available storm water storage. The hydrology of surface waters, recharge rates for groundwater, and runoff pollutant composition and concentration could change, depending on the type and extent of any secondary developments that may occur as a result of the proposed project. The type and magnitude of the changes depend on the type, density and location of the development. Secondary impacts from this development could also result in cumulative effect over time.

It is not anticipated that the proposed project will generate substantial growth or induced development. Although some development could occur at and around some of the proposed interchanges along the Preferred Alternate, no large scale commercial or industrial development or uncontrolled or substantial growth is anticipated. As a result, no meaningful secondary or cumulative impacts to water quality, flood plains or groundwater are anticipated.

- **Cultural Resources**

The proposed project is not expected to result in any secondary or cumulative impacts to historic sites or sensitive archaeological areas. At present, there are no other currently planned or proposed projects that would impact cultural resources sites, so that there are no cumulative impacts which would affect the viability of these resources.

- **Vegetation/Wildlife Habitat/Threatened and Endangered Species**

The proposed project is not expected to result in any meaningful secondary or cumulative impacts to vegetation, wildlife habitat or threatened and endangered species. The proposed project will result in direct impacts to vegetation, wildlife habitat and sensitive species. However, these impacts are not expected to be substantial. The potential for indirect or secondary impacts are not expected to be considerable. The proposed project is not expected to generate any new development or roadway projects other than those planned under the proposed project design. Since noise, air quality, storm water runoff and impacts to surface water resources are not



expected to be substantial, and, by introduction of Best Management Practices and appropriate mitigation, no unforeseen indirect or cumulative impacts are anticipated.

- **Wetlands**

Wetlands would be affected by changes in hydrology, water quality and as a result of the placement of fill. Secondary and cumulative impacts to wetlands could result from increased development other than the construction activities associated with the proposed project. Additional development would increase the chance that wetlands in the area would experience a decrease in water quality, which could affect the wetland habitat characteristics. These secondary impacts to wetlands may be tempered by the U.S. Army Corps of Engineers' regulations governing wetland permits, as well as local storm water management ordinances. Since project related impacts to wetlands will be governed by the regulations of the U.S. Army Corps of Engineers and the IDNR, and since the proposed project is not expected to result in any substantial growth and development, no cumulative impacts to wetlands are anticipated. However, some development may occur around and at several of the Preferred Alternate interchanges and intersections. This development could directly impact wetland areas. Under these circumstances, secondary impacts to wetland areas could result. However, local zoning ordinances and land use controls could serve to control and limit development in and around wetland areas. Federal permitting requirements will also serve to limit any meaningful secondary impacts to wetland areas within the project corridor.

The proposed project is also not envisioned as inducing development within wetlands which would result from the implementation of the planned road and interchange or intersection improvements by the State of Illinois. These road improvements are being planned independent of the proposed project. Although wetland impacts could result from these projects, federal and state permitting regulations and requirements would serve to limit the potential for cumulative impacts to these wetland areas. The potential for cumulative impacts to wetlands within the project corridor will also be offset by mitigation requirements through the replacement of wetlands of equal value and function.

- **Agriculture**

Agricultural land is located throughout the entire project area, except where upland forested areas, wetlands, other cover types, and developed land currently exist. The existing housing and recreational pressure is concentrated around the southern portion of the Galena Territory and just west of Woodbine. The likelihood of the existing agricultural land remaining in agricultural use seems good — at least for the foreseeable future.

4.15 List of Commitments and Mitigation Measures

The Department is committed to implementing the following mitigation measures for the impacts associated with the construction of the proposed project:

Wetland Loss:

The Preferred Alternate will impact approximately **1.47** hectares (**3.63** acres) of wetlands. It is proposed to mitigate these impacts by purchasing wetland credits from the Kilbuck Creek Bank south of Rockford. This bank site is located within the Rock River Drainage Basin. It is estimated that approximately **7.18** hectares (**17.75** acres) will need to be purchased by the Department at a cost to be determined at the time of purchase.



Karst Features: During construction, if some of the Karst features are uncovered, the Department will analyze the situation and obtain a solution that will avoid these features becoming direct conduits for highway runoff to enter the groundwater.

Native Prairie Restoration: The Department will pursue acquisition of a conservation easement for a portion of two farm tract parcels located immediately adjacent to the dolomite hill prairie that will be on the states right-of-way. The easement will be sought in order to protect approximately 10.1 hectares (25 acres) of the remaining dolomite prairie. A prairie mitigation plan will be prepared and coordinated with IDNR for this site. Although the Department will seek the easement, cooperation from the landowner(s) will be required, as well as a commitment from a conversation organization to manage the site once it has been designated for protection.

The Department will **also** purchase the 4.21 hectares (10.4 acres) landlocked parcel (T-1356) located north of Buckhill Road (between right Station 649+00 and 666+00) **for the establishment of a mesic prairie**. The parcel will be seeded with native prairie vegetation using the appropriate species from Class 4 and 5 seeding mixture contained in the Department's "Standard Specifications for Road and Bridge Construction" (January 2002). **A prairie mitigation plan will be prepared and coordinated with IDNR for this site.** This action will mitigate the 0.4 hectares (1.0 acres) of native grassland that will be impacted by the Preferred Alternate.

Reforestation/Habitat Fragmentation:

The Department will purchase six parcels of land that are located between the Preferred Alternate and the Tapley Woods Land and Water Reserve. These parcels are parcel numbers T-694, T-697, T-2472, T-2806, T-2878 and T-3460. These six parcels total 209.5 acres, of which about 105 acres are not forested. The areas that are not wooded and are suitable for trees will be planted with native tree species. By planting forest vegetation on the parcels adjacent to Tapley Woods, a larger contiguous tract of forest will develop over time. This type of large block of forest is required by many species of forest birds to nest successfully. This mitigation should be beneficial to Neotropical migrant birds that nest in the project area as well as create a larger protected buffer area for the timber rattlesnake.

Also, the Department will purchase one landlocked parcel adjacent to the Horseshoe Mound Geological Natural Area (parcel number T-621) and one landlocked parcel near the wetlands along Rush Creek (parcel number T-1633). These two parcels have a total of 109.8 acres, with about 82 acres that are not forested. These areas would also be restored



with forest species. The addition of these two parcels to the adjoining parcels would expand the existing ecosystems of forested and wetland communities. A total of approximately 187 acres will be mitigated by reforesting the eight parcels listed above.

The Department will identify and acquire additional land areas with non-wooded sections, and plant trees for the express purpose of mitigating the overall impacts to wooded areas at an aggregate one to one ratio (planted to removed).

A tree/shrub replacement plan will be prepared and coordinated with IDNR.

This action will mitigate the loss of 110.9 hectares (274 acres) of forest due to the construction of the Preferred Alternate.

After planting, the Department will transfer these landlocked parcels (described above) to IDNR.

The Department will replant riparian trees and shrubs in the floodplains within highway right of way of the Galena River, Apple River, Smallpox Creek, Unnamed Tributary of Longhollow Creek, Furnace Creek, and Yellow Creek and its tributaries. The Department will also attempt to obtain agreements with the adjacent property owners to plant trees and shrubs on their property within the riparian corridor.

Wildlife Barriers:

In an attempt to eliminate some of the barriers created by the new roadway to wildlife movement, the bridges are being designed with longer spans. The spans will be extended to provide a minimum of 3 meters (10 feet) of dry ground above the 50-year flood elevation on each side of the stream. This will allow wildlife movement along the stream corridors.

At least seven culverts, especially those proposed near Stations 960, 1002, 1069, 1108, 1126, 1190, and 1215, will be constructed to have an opening that is wider than the normal stream channel. These culverts will be a minimum of 3 meters by 3 meters (10 feet by 10 feet) (depending on the "Openness Ratio for Deer"). This will allow for safe wildlife crossings including the timber rattlesnake in the Tapley Woods area.

The Department will install both medium and large sized culverts in some of the fill areas near Tapley Woods **and in other appropriate areas**. The specific locations will be determined as part of the Phase II design of the roadway. These culverts will not be associated with drainage, but will allow wildlife a safe passage across the roadway. These culverts will be a minimum of 1.5 meters by 1.5 meters (5 feet by 5 feet) for medium size and spread 152 to 274 meters (500 to 900 feet) apart, and 1.5 meters by 1.5 meters (10 feet by 10 feet) for large size that are spread 1 to 1.1 kilometers (0.6 to 0.7 miles) apart.



Fencing is an important component of wildlife crossings. The proposed project design includes the standard 1.2-meter (4-foot) high fencing along the right-of-way line. In addition to this fencing, a special 2.5-meter (8-foot) high fence will be installed at the wildlife crossings (culverts and bridges) to “funnel” wildlife into the crossings. Fencing will also be installed in the median, if the crossing (bridge or culvert) opens in the median, to prevent wildlife from getting onto the roadway.

Culverts constructed in the fill areas cannot be designed to open in the median. Since ambient light is a critical factor for usage of wildlife underpasses, light will be provided by placing two vaults near the center of the culverts. The vaults would be placed on the median slopes and would be grated. The grated vaults would be above the median ditch flow line to prevent excessive drainage into the culverts.

Timber Rattlesnake:

At least seven culverts, especially those proposed near Stations 960, 1002, 1069, 1108, 1126, 1190, and 1215, will be constructed to allow for safe crossing of the roadway by the timber rattlesnake in the Tapley Woods area.

A herpetologist from the Illinois Natural History Survey will be employed to determine whether or not the timber rattlesnake occurs within the construction limits before construction begins and during construction in the roadway section near the Tapley Woods Land and Water Reserve. The herpetologist will begin the survey about one month before construction begins. **Any rattlesnakes identified within the construction area will be relocated during construction.**

Neotropical Migrants:

The Department commits to including in the design plans special provisions prohibiting deforestation activities during calendar months when it may be harmful to migratory birds as shown in Table 4-10.

In the area from west of Smallpox Creek (Station 870) to west of Furnace Creek (Station 1210) there will be no tree removal between April 15 and September 5. All of the area-sensitive Neotropical migrant birds identified on the project occur within this section.

Public Involvement:

The Department commits to the Advisory Council’s recommendation “ensuring that a citizen advisory group is involved in the design and construction of the facility to ensure effective mitigation of the negative impacts of the project.” The Department also commits to actively pursue the involvement of the U.S. Department of the Interior as part of the public involvement.



Review and comment periods will be afforded to the citizen's advisory group during the project design phase.

Lighting:

Lighting for the project will be established only at the eight interchanges. At these interchanges only partial interchange lighting will be installed. Lighting will occur at the ramp gores along U.S. Route 20, the crossroad intersections, and the bridges at these interchange locations. The Department will provide "full cutoff" lighting that directs light only to locations where it is needed.

Visual/Aesthetics:

The Department will consider the use of scenic bridge design, landscaping, and the planting of woody riparian vegetation in the adjacent Apple River floodplain as much as possible to reduce the visual impacts. The Department commits to actively pursue the involvement of the National Park Service and the Illinois Department of Natural Resources as part of the project coordination concerning the Apple River.

4.16 Short-Term Use and Long-Term Productivity Relationship

Short-term environmental impacts would include air pollution resulting from emissions and dust from construction equipment. Construction equipment would also temporarily increase noise levels in the area. Water quality and ecological resources would be temporarily impacted. The removal of ground cover during construction activities could lead to erosion and sedimentation and turbidity in area streams. These impacts will be minimized by implementing erosion control techniques, as stipulated in the current *Standard Specifications for Road and Bridge Construction*.

The most evident long-term benefit of the construction of the proposed project would be improved local and regional accessibility and travel safety. Long-term economic benefits resulting from the construction of the proposed project would include increased tax revenues and employment. Initially, the removal of properties from the tax base for construction of the road would reduce tax revenues for various taxing districts. However, the improved access resulting from the construction of the proposed project would provide an opportunity for economic growth by expanding market areas and making the area more attractive to new development. New and expanded businesses would in turn create new employment opportunities.

4.17 Irreversible and Irretrievable Commitments of Resources

The land used in the construction and operation of the proposed project is considered to be an irreversible commitment during the time period that the land is used for construction and during the operational periods.

The proposed project will require the use of various types of fossil fuels, electrical energy and other resources during the construction and operation of the proposed project. The use of these resources is not expected to result in an adverse effect upon the continued availability of these resources. The proposed project will also require the commitment of various types of construction materials, including cement, aggregate, steel and asphalt (bituminous materials), electrical supplies, piping and other raw materials such as metal, stone, sand and fill material, as well as large amounts of labor and natural resources. This commitment of resources is



considered to be irretrievable. However, these resources and materials are also not in short supply, and their use will not result in any adverse effect upon their continued availability.

The construction and operation of the proposed project will also require the commitment and expenditure of county, state and federal funds which will not be available for other projects and activities. This commitment of resources is considered to be irretrievable.

The proposed project is not expected to result in any non-beneficial impacts to pristine areas, wetlands or habitats. Although the commitment of land is considered to be an irreversible commitment, it is not expected to be adverse in light of the opportunity for appropriate mitigation and the availability of suitable alternative habitats in the nearby area. The loss of agricultural land is considered to be irreversible.

Although not expected, some potential induced development in nearby adjacent areas could result that otherwise would possibly occur if the proposed project were not constructed. Though the nature of this potentially accelerated and secondary development can be controlled through the application of appropriate land use regulations, acceleration of development projects or any unanticipated or induced development that may result is, for all practical purposes, an irreversible commitment of resources (land and materials).

The commitment of resources as a result of the proposed project is based upon the concept that residents and businesses in the project area and throughout the region will benefit by improved local and regional access, the overall improvement of regional road transportation, and improvement to the transit network. These benefits are anticipated to outweigh the irretrievable and irreversible commitment of these resources.

